Washtenaw Community College Comprehensive Report

BIO 115 Life Science for Elementary Teachers
Effective Term: Fall 2024

Course Cover

College: Math, Science and Engineering Tech
Division: Math, Science and Engineering Tech
Department: Life Sciences
Discipline: Biology
Course Number: 115
Org Number: 12110
Full Course Title: Life Science for Elementary Teachers
Transcript Title: Life Science Elem. Teachers
Is Consultation with other department(s) required: No
Publish in the Following:
Reason for Submission: New Course
Change Information:
Rationale: BIO 115 is a new course being created to meet the state requirements for the new program in Elementary Education at WCC.
Proposed Start Semester: Fall 2024
Course Description: In this course, students will learn basic scientific principles and methods, fundamentals of biochemistry, cells, genetics, and explore the evolution and ecology of biodiversity. The course will also explore a range of teaching methods and pedagogical resources relevant to elementary science education. This lecture and lab course meets MDE Science Standards for the Preparation of Teachers (PK-6), and is an introductory life science/biology course for students who plan to become elementary (PK-6) teachers. Biology non-majors who are not seeking an elementary education degree should take BIO 101. Biology majors should take BIO 161 and BIO 162.

Course Credit Hours

Variable hours: No
Credits: 4
Lecture Hours: Instructor: 45 **Student:** 45
Lab: Instructor: 45 **Student:** 45
Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 90 **Student:** 90
Repeatable for Credit: NO
Grading Methods: Letter Grades
Audit
Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

No Level Required

Requisites

General Education

Request Course Transfer

Proposed For:

Eastern Michigan University

Student Learning Outcomes

1. Identify and apply the basic principles of the scientific method based on research questions, published scientific literature, data analysis, and figures.
   Assessment 1
   Assessment Tool: Five common outcome-related exam questions
   Assessment Date: Fall 2027
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: Answer key
   Standard of success to be used for this assessment: 70% of students will score a 70% or higher
   Who will score and analyze the data: Departmental faculty

2. Identify key aspects of biochemistry, cellular structure and function, cell metabolism, gene expression, and reproductive biology.
   Assessment 1
   Assessment Tool: Five common outcome-related exam questions
   Assessment Date: Fall 2027
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: Answer key
   Standard of success to be used for this assessment: 70% of students will score a 70% or higher
   Who will score and analyze the data: Departmental faculty

3. Compare and contrast the biology, ecology, and evolution of the six major groups of living organisms.
   Assessment 1
   Assessment Tool: Five common outcome-related exam questions
   Assessment Date: Fall 2027
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: Answer key
   Standard of success to be used for this assessment: 70% of students will score a 70% or higher
   Who will score and analyze the data: Departmental faculty

4. Develop and apply appropriate pedagogical tools for teaching life sciences to PK-6 grade students.
   Assessment 1
   Assessment Tool: Course project/learning activity
   Assessment Date: Fall 2027
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: Departmentally-developed rubric
   Standard of success to be used for this assessment: 70% of students will score a 70% or higher
   Who will score and analyze the data: Departmental faculty

5. Demonstrate the proper use and application of laboratory skills related to biological investigation.

Assessment 1

Assessment Tool: Final lab exam
Assessment Date: Fall 2027
Assessment Cycle: Every Three Years
Course section(s)/other population: All
Number students to be assessed: All
How the assessment will be scored: Answer key
Standard of success to be used for this assessment: 70% of students will score 70% or higher
Who will score and analyze the data: Departmental faculty

Course Objectives

1. Describe each step of the scientific method. (Addresses MI Standards for the Preparation of Teachers of PK-6 Education, S.1.B & S.2.C).
2. Analyze and interpret scientific data sets, graphs and figures, and published scientific literature. (Addresses MI Standards for the Preparation of Teachers of PK-6 Education, S.1.B, S.2.C, S.6.A).
3. Recognize the structure of organisms on a cellular and anatomical level, and relate their structures to functions that support life, growth, and reproduction. (Addresses MI Standards for the Preparation of Teachers of PK-6 Education, S.1.B & S.2.C).
4. Identify the major biochemical molecules and reactions that regulate cell metabolism and cell life cycle. (Addresses MI Standards for the Preparation of Teachers of PK-6 Education, S.1.B & S.2.C).
5. Explain the processes and reactions of DNA, RNA, genetic inheritance and reproductive biology. (Addresses MI Standards for the Preparation of Teachers of PK-6 Education, S.1.B & S.2.C).
6. Identify the mechanisms of evolution and how they led to the diversity of living things. (Addresses MI Standards for the Preparation of Teachers of PK-6 Education, S.1.B & S.2.C).
7. Recognize the current models used to classify and taxonomize the major groups of living things. (Addresses MI Standards for the Preparation of Teachers of PK-6 Education, S.1.B & S.2.C).
8. Compare and contrast the biological characteristics of the major groups of living things. (Addresses MI Standards for the Preparation of Teachers of PK-6 Education, S.1.B & S.2.C).
9. Recognize how organisms interact with each other and their abiotic environment to obtain energy, grow and reproduce. (Addresses MI Standards for the Preparation of Teachers of PK-6 Education, S.1.B & S.2.C).
10. Recognize how ecosystems are classified and organized in relation to abiotic and biotic factors. (Addresses MI Standards for the Preparation of Teachers of PK-6 Education, S.1.B & S.2.C).
11. Identify and create life science lessons appropriate for effective science teaching and learning at the PK-6 level. (Addresses MI Standards for the Preparation of Teachers of PK-6 Education, S.1.B, S.2.C, S.3.B).
12. Explain the processes of replication, transcription, translation (Addresses MI Standards for the Preparation of Teachers of PK-6 Education, S.1.B., S.2.C.).
13. Identify the four major steps in protein structure and folding. (Addresses MI Standards for the Preparation of Teachers of PK-6 Education, S.1.B., S.2.C.).
14. Compare and contrast the three major types of evolutionary selection pressures - artificial, natural, sexual. (Addresses MI Standards for the Preparation of Teachers of PK-6 Education, S.1.B., S.2.C.).
15. Discuss the scientific principles and major causes of climate change. (Addresses MI Standards for the Preparation of Teachers of PK-6 Education, S.1.B., S.2.C.).

New Resources for Course

Course Textbooks/Resources

Textbooks

OpenStax OER. *Concepts of Biology*, ed. OpenStax , 2017

Manuals
Periodicals
Software

Equipment/Facilities

Level I classroom
Testing Center
Other: Biology laboratory classroom

Reviewer	Action	Date
Faculty Preparer:		
David Wooten	*Faculty Preparer*	*Jul 03, 2023*
Department Chair/Area Director:		
Susan Dentel	*Recommend Approval*	*Jul 07, 2023*
Dean:		
Tracy Schwab	*Recommend Approval*	*Jul 10, 2023*
Curriculum Committee Chair:		
Randy Van Wagnen	*Recommend Approval*	*Jan 07, 2024*
Assessment Committee Chair:		
Jessica Hale	*Recommend Approval*	*Jan 08, 2024*
Vice President for Instruction:		
Brandon Tucker	*Approve*	*Jan 09, 2024*