Washtenaw Community College Comprehensive Report

BIO 237 Microbiology
Effective Term: Winter 2019

Course Cover

Division: Math, Science and Engineering Tech
Department: Life Sciences
Discipline: Biology
Course Number: 237
Org Number: 12100
Full Course Title: Microbiology
Transcript Title: Microbiology
Is Consultation with other department(s) required: No
Publish in the Following: College Catalog , Time Schedule , Web Page
Reason for Submission: Three Year Review / Assessment Report
Change Information:
Consultation with all departments affected by this course is required.
Course description
Outcomes/Assessment
Objectives/Evaluation
Rationale: 3 year syllabus review
Proposed Start Semester: Winter 2019
Course Description: This course is an introduction to the structure and genetics of microbes that have a significant impact on humans. The epidemiology and prevention of infectious disease as well as events involved in immunity and pathogenesis within the body are covered. Finally, the course includes a survey of infectious diseases of major body systems. The lab is an introduction to basic microbiological skills with an emphasis on aseptic technique and scientific reasoning.

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

Requisites

Prerequisite
BIO 101 minimum grade "C"
or
Prerequisite
BIO 111 minimum grade "C"

or
Prerequisite
BIO 161 minimum grade "C"
or
Prerequisite
BIO 162 minimum grade "C"

General Education

MACRAO
MACRAO Science & Math
MACRAO Lab Science Course
General Education Area 4 - Natural Science
Assoc in Applied Sci - Area 4
Assoc in Science - Area 4
Assoc in Arts - Area 4
Michigan Transfer Agreement - MTA
MTA Lab Science

Request Course Transfer

Proposed For:

Student Learning Outcomes

1. Recognize major subcellular and molecular structures in bacteria and viruses.
   Assessment 1
   Assessment Tool: Multiple-choice, matching, etc. test questions
   Assessment Date: Winter 2018
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: Item analysis
   Standard of success to be used for this assessment: 100% of the students will score 75% or higher on the outcome questions
   Who will score and analyze the data: Department faculty

2. Recognize fundamental principles of molecular genetics.
   Assessment 1
   Assessment Tool: Multiple-choice, matching, etc. test questions
   Assessment Date: Winter 2018
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: Item analysis
   Standard of success to be used for this assessment: 100% of the students will score 75% or higher on the outcome questions
   Who will score and analyze the data: Department faculty

3. Recognize epidemiological terminology used to describe pathogen transmission and the occurrence of disease in a population.
   Assessment 1
   Assessment Tool: Multiple-choice, matching, etc. test questions
   Assessment Date: Winter 2018
   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. Item analysis will take place.

Standard of success to be used for this assessment: 100% of the students will score 75% or higher on the outcome questions
Who will score and analyze the data: Department faculty

4. Identify major mechanisms of pathogenesis within the human body and the body's major defenses against infectious disease.
   Assessment 1
   Assessment Tool: Multiple-choice, matching, etc. test questions
   Assessment Date: Winter 2018
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: Item analysis
   Standard of success to be used for this assessment: 100% of the students will score 75% or higher on the outcome questions
   Who will score and analyze the data: Department faculty

5. Demonstrate proficient use of the microscope and preparation of high-quality slides of bacteria.
   Assessment 1
   Assessment Tool: Skills checklist
   Assessment Date: Winter 2018
   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: 75% of students will score 4 or higher on a 5-point scale
   Who will score and analyze the data: Department faculty

6. Use basic aseptic techniques in the microbiology lab.
   Assessment 1
   Assessment Tool: Skills checklist
   Assessment Date: Winter 2018
   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: 75% of students will score 4 or higher on a 5-point scale
   Who will score and analyze the data: Department faculty

7. Design, execute, and present an original microbiological experiment.
   Assessment 1
   Assessment Tool: Student presentation
   Assessment Date: Winter 2019
   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 25 or higher on a 30-point rubric
   Who will score and analyze the data: Department faculty

Course Objectives

1. Recognize the medical importance of the bacterial capsule.
2. Recognize the Gram positive and Gram negative cell walls.
3. Recognize the medical importance of the Gram negative cell wall.

4. Recognize the medical importance of a bacterial endospore.
5. Identify the structure and function of a generalized virus, including genetic material and surface proteins.
6. Recognize the molecular structure of DNA.
7. Recognize transcription and translation.
8. Recognize the structure of a protein.
9. Identify the relationships between nucleotides, DNA, a gene, a chromosome and a protein.
10. Recognize three types of horizontal gene transfer in bacteria.
11. Recognize the importance of the universality of the genetic code.
12. Recognize contact, airborne, vehicle and vector transmission, and cite diseases with each mode of transmission.
13. Recognize the terms prevalence, incidence, morbidity and mortality.
14. Define virulence factors and give several real examples.
15. List the cells and chemical stimuli mediating inflammation.
16. Recognize the work of macrophages as phagocytes and in adaptive immunity.
17. Recognize the work of lymphocytes in adaptive immunity.
18. Recognize at the cellular and molecular level how vaccines work.
19. Identify signs and symptoms for select infectious diseases of the skin, respiratory, digestive, nervous and genitourinary systems.
20. Focus a microscope using the oil immersion lens.
21. Prepare a bacterial smear and Gram stain it.
22. Work in the lab in observance of standard safety protocols.
23. Design, carry out, analyze, and present an original experiment.

New Resources for Course

Course Textbooks/Resources

Textbooks

Parker, N. et al.. *Microbiology*, 1 ed. OpenStax, 2016, ISBN: 9781938168147.

Manuals

Heise, A.. Bio 237 Microbiology, Washtenaw Community College, 09-01-2018

Periodicals

Software

Equipment/Facilities

Level III classroom

Other: Laboratory equipped with materials for aseptic handling of microbes.

Reviewer	Action	Date
Faculty Preparer:		
Anne Heise	*Faculty Preparer*	*Sep 05, 2018*
Department Chair/Area Director:		
Anne Heise	*Recommend Approval*	*Sep 05, 2018*
Dean:		
Kristin Good	*Recommend Approval*	*Sep 06, 2018*
Curriculum Committee Chair:		
Lisa Veasey	*Recommend Approval*	*Oct 18, 2018*
Assessment Committee Chair:		
Shawn Deron	*Recommend Approval*	*Oct 22, 2018*
Vice President for Instruction:		
Kimberly Hurns	*Approve*	*Nov 02, 2018*