Washtenaw Community College Comprehensive Report

BIO 237 Microbiology
Effective Term: Spring/Summer 2023

Course Cover

College: Math, Science and Engineering Tech
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:
Change Information:
Consultation with all departments affected by this course is required.
Objectives/Evaluation
Rationale: I want to update some of the assessment language in light of the VCLASS option I developed during the Covid-19 pandemic.
Proposed Start Semester: Spring/Summer 2023
Course Description: In this course, students are introduced 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

No Level Required

Requisites

Prerequisite
BIO 101 minimum grade "C"
or
Prerequisite
BIO 102 minimum grade "C"
or
Prerequisite
BIO 109 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: Outcome-related embedded multiple-choice, matching, True/False, and/or labeling questions.
   Assessment Date: Winter 2024
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All students
   How the assessment will be scored: Questions will be scored using an answer key. An item analysis will be completed.
   Standard of success to be used for this assessment: 70% of a pool of questions will be answered correctly.
   Who will score and analyze the data: Department faculty

2. Recognize fundamental principles of molecular genetics.
   Assessment 1
   Assessment Tool: Outcome-related embedded multiple-choice, matching, True/False, and/or labeling questions.
   Assessment Date: Winter 2024

Assessment Cycle: Every Three Years
Course section(s)/other population: All sections
Number students to be assessed: All students
How the assessment will be scored: Questions will be scored using an answer key. An item analysis will be completed.
Standard of success to be used for this assessment: 70% of a pool of questions will be answered correctly.
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: Outcome-related embedded multiple-choice, matching, True/False, and/or labeling questions.
   Assessment Date: Winter 2024
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All students
   How the assessment will be scored: Questions will be scored using an answer key. An item analysis will be completed.
   Standard of success to be used for this assessment: 70% of a pool of questions will be answered correctly.
   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: Outcome-related embedded multiple-choice, matching, True/False, and/or labeling questions.
   Assessment Date: Winter 2024
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All students
   How the assessment will be scored: Questions will be scored using an answer key. An item analysis will be completed.
   Standard of success to be used for this assessment: 70% of a pool of questions will be answered correctly.
   Who will score and analyze the data: Department faculty

5. Demonstrate or describe proficient use of the microscope and identify stained bacteria correctly.
   Assessment 1
   Assessment Tool: Skills checklist or alternate assignment
   Assessment Date: Winter 2024
   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 for the skills checklist; holistic assessment of alternate assignment.
   Standard of success to be used for this assessment: For the rubric: 70% of students will score 4 (80%) or higher on a 5-point scale. For the alternate assignment: 70% of students will score 8 (80%) or higher on a 10-point assignment.
   Who will score and analyze the data: Department faculty

6. Recognize aseptic techniques in the microbiology lab.

Assessment 1

Assessment Tool: Skills checklist or alternate assignment
Assessment Date: Winter 2024
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 for the skills checklist. Holistic assessment of alternate assignment.
Standard of success to be used for this assessment: For the rubric: 70% of students will score 4 (80%) or higher on a 5-point scale. For the holistic assessment: 70% of students will score 8 (80%) or higher on a 10-point assignment.
Who will score and analyze the data: Department faculty

7. Design, execute, and present an original microbiological experiment.

Assessment 1

Assessment Tool: Student presentation, or alternate student project.
Assessment Date: Winter 2024
Assessment Cycle: Every Three Years
Course section(s)/other population: All
Number students to be assessed: All
How the assessment will be scored: For the presentation: departmentally-developed rubric. For the alternate assignment: holistic assessment of 10-point lab exercise.
Standard of success to be used for this assessment: For the presentation: 70% of students will score 24 (80%) or higher on a 30-point rubric. For the lab exercise: 70% of students will score 8 (80%) or higher on a 10-point lab exercise.
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 three types of horizontal gene transfer in bacteria.
9. Recognize contact, respiratory droplet, fomite, airborne, vehicle and vector transmission.
10. Recognize the terms prevalence, incidence, morbidity and mortality.
11. Define virulence factors and give several real examples.
12. List the mechanisms, outcomes, and benefits of the inflammatory response.
13. Recognize the work of macrophages as phagocytes and in adaptive immunity.
14. Recognize the work of lymphocytes in adaptive immunity.
15. Recognize at the cellular and molecular level how vaccines work.
16. Identify signs and symptoms for select infectious diseases of the skin, cardiovascular, respiratory, digestive, nervous and genitourinary systems.
17. Recognize the need to use immersion oil with the 100X objective lens on a light microscope.
18. Demonstrate or describe how to prepare a bacterial smear and Gram stain it.
19. Recognize standard safety protocols and/or work in the lab in observance of them.
20. Design, carry out, analyze, and present an original experiment.
21. Recognize the work of neutrophils and the dangers of neutropenia.

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

Computer workstations/lab

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

Reviewer	Action	Date
Faculty Preparer:		
Anne Heise	*Faculty Preparer*	*Nov 02, 2022*
Department Chair/Area Director:		
Susan Dentel	*Recommend Approval*	*Nov 11, 2022*
Dean:		
Tracy Schwab	*Recommend Approval*	*Nov 14, 2022*
Curriculum Committee Chair:		
Randy Van Wagnen	*Recommend Approval*	*Dec 09, 2022*
Assessment Committee Chair:		
Shawn Deron	*Recommend Approval*	*Dec 23, 2022*
Vice President for Instruction:		
Victor Vega	*Approve*	*Jan 13, 2023*

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Org Number: 12100
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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.
Pre-requisite, co-requisite, or enrollment restrictions
Outcomes/Assessment
Objectives/Evaluation
Rationale: Updating the syllabus.
Proposed Start Semester: Spring/Summer 2021
Course Description: In this course, students are introduced 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.

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General Education Area 4 - Natural Science
Assoc in Applied Sci - Area 4
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10. Recognize the terms prevalence, incidence, morbidity and mortality.
11. Define virulence factors and give several real examples.
12. List the mechanisms, outcomes, and benefits of the inflammatory response.
13. Recognize the work of macrophages as phagocytes and in adaptive immunity.
14. Recognize the work of lymphocytes in adaptive immunity.
15. Recognize at the cellular and molecular level how vaccines work.
16. Identify signs and symptoms for select infectious diseases of the skin, cardiovascular, respiratory, digestive, nervous and genitourinary systems.
17. Focus a microscope using the oil immersion lens.
18. Prepare a bacterial smear and Gram stain it.
19. Recognize standard safety protocols and/or work in the lab in observance of them.
20. Design, carry out, analyze, and present an original experiment.
21. Recognize the work of neutrophils and the dangers of neutropenia.

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Equipment/Facilities

Level III classroom

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

Reviewer	Action	Date
Faculty Preparer:		
Anne Heise	*Faculty Preparer*	*Apr 02, 2021*
Department Chair/Area Director:		
Anne Heise	*Recommend Approval*	*Apr 02, 2021*
Dean:		
Victor Vega	*Recommend Approval*	*Apr 03, 2021*
Curriculum Committee Chair:		
Lisa Veasey	*Recommend Approval*	*May 24, 2021*
Assessment Committee Chair:		
Shawn Deron	*Recommend Approval*	*Jun 20, 2021*
Vice President for Instruction:		
Kimberly Hurns	*Approve*	*Jun 23, 2021*