RARITAN VALLEY COMMUNITY COLLEGE
ACADEMIC COURSE OUTLINE

BIOL221 - Microbiology

I. Basic Course Information

A. Course Number and Title: BIOL221 - Microbiology

B. New or Modified Course: Modified

C. Date of Proposal: Semester: Fall Year: 2023

D. Effective Term: Fall 2024

E. Sponsoring Department: Science and Engineering

F. Semester Credit Hours**: 4**

G. Weekly Contact Hours**:** 6 Lecture**:** 3
Laboratory**:** 3
Out of class student work per week: 7.5

H. ☒ Prerequisite (s): BIOL102 – General Biology II and CHEM103- General Chemistry I
☐ Corequisite (s):
☐ Prerequisite (s) and Corequisite (s):

I. Additional Fees**:** None

J. Name and E-Mail Address of Department Chair and Divisional Dean at time of approval**:** Dr. Marianne Baricevic, marianne.baricevic@raritanval.edu, Dr. Sarah Imbriglio, sarah.imbriglio@raritanval.edu

II. Catalog Description

Prerequisites: BIOL 102 - General Biology II and CHEM 103 -General Chemistry I. A comprehensive study of microorganisms including morphology, physiology, genetics, evolution, identification and classification will be covered. The course will include the role and impact of microorganisms in health, medicine, biotechnology, ecology and industrial applications with an emphasis on pathogen-host interactions. The methods to culture, control and identify microbes will be discussed with the laboratory component providing practical skills in this area. The laboratory will include techniques such as, culture methods, aseptic technique, microscopy, metabolic and physiological tests, bacterial isolation and identification, and molecular and serological analysis. Three hours of lecture and three hours of laboratory per week.

III. Statement of Course Need

A. This course serves as a 200-level Biology course as one of the two required for the AS Biology program.

B. In the laboratory portion of the course, students will utilize microbial techniques essential for the culturing, control and identification of microorganisms.

C. This course generally transfers as a Biology program requirement and/or a free elective.

IV. Place of Course in College Curriculum

A. Free Elective
B. This course does not satisfy a general education requirement.
C. This course meets a program requirement for AS Biology as a 200 level Biology course, AS Environmental Science as an Environmental Science elective and the AS General Science/Pre-Health Professional as a Laboratory Science elective.
D. To see course transferability: a) for New Jersey schools, go to the NJ Transfer website, www.njtransfer.org; b) for all other colleges and universities, go to the individual websites.

V. Outline of Course Content

A. History and general applications of microbiology.

B. Observing microorganisms utilizing microscopy and staining methods.

C. Comparison of prokaryotic and eukaryotic cells.

D. Factors affecting microbial growth, culturing microorganisms, aseptic techniques, antibiotics and bactericidal to control microbial growth.

E. Microbial metabolism and enzymatic activities.

F. Microbial genetics and biotechnology as related to medicine and human health.

G. Bacterial pathogens.

H. Acellular pathogens including viruses and prions.

I. Eukaryotic pathogens including fungi, protozoa and helminthes.

J. Classification of microorganisms: Taxonomy, Phylogeny and Nomenclature.

K. Epidemiology

L. Immunology with emphasis on resistance factors related to infectious disesase, vaccinations and antibiotics.

M. Applied and environmental microbiology and industrial uses such as fermentation.

VI. A. Course Learning Outcomes:

At the completion of the course, students will be able to:

1. Utilize appropriate laboratory techniques. (GE-3)
2. Apply the scientific method to identify microbes and determine appropriate treatment and disinfectants (GE-3 *)
3. Locate, review, interpret and analyze scientific information and present the findings. (GE-1, IL)
4. Identify and discuss ethical issues in biomedical sciences (GE-1, ER)
5. Compare and contrast the characteristics of microbes; including bacteria, protozoans, viruses, prions and parasitic worms. (GE-3)

(* Embedded Critical Thinking)

B. Assessment Instruments

Given the outcomes described above, LIST which of the following assessment methods may be used; please note any instruments that will be ***required*** to assess outcomes as listed above (e.g., research papers for information literacy):

1. research paper (required)
2. projects
3. exams

Given the outcomes described above, the following assessment methods may be used:

A. performance of laboratory techniques
B. presentation of research findings
C. analysis of reading assignments
D. analysis of clinical case studies
E. quizzes
F. semester examinations
G. cumulative final examination

VII. Grade Determinants

The following may be used to determine the final grade:

A. Semester examinations
B. Cumulative final exam
C. Quizzes
D. Chapter homework assignments
E. Student presentation
F. Laboratory notebooks & reports, including identification of unknown microbe

Given the goals and outcomes described above, the following primary formats, modes, and methods for teaching and learning may be used include:

A. lecture/discussion
B. small-group work
C. computer-assisted instruction
D. laboratory
E. student oral presentations
F. student collaboration
G. independent study

VIII. Texts and Materials

The following types of course materials may be used:

- textbooks
- primary sources
- student writing
- web sources
- databases

Samples of specific text that may be featured:
Focusing on Health: Lab Exercises in Microbiology (TH) Author: Weber. Publisher: TOP HAT

Microbiology: An Introduction by Tortora, Benjamin-Cummings Publishers. (Most Recent Edition).

(Please Note: The course outline is intended only as a guide to course content and resources. Do not purchase textbooks based on this outline. The RVCC Bookstore is the sole resource for the most up-to-date information about textbooks.)

IX. Resources

Students may need to use library databases and other library resources for critical research assignments and/or computers. Students will utilize the microscope and laboratory equipment available in the RVCC Microbiology laboratory.

X. Check One: ☐Honors Course ☐Honors Options ☒ N/A