Syllabus
BIOS2460
Microbiology
2019

Committee Members:
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Leah Christensen, Mid-Plains Community College
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Facilitator: Dr. Leah Christensen

The Institution agrees to the contents in this syllabus including course prefix, number, course description and other contents of this syllabus.

Adopt

Manoj Patil
Chief Academic Officer, Little Priest Tribal College

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Thomas J McDonnell
Chief Academic Officer, Metropolitan Community College

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Jody Tomanek
Chief Academic Officer, Mid-Plains Community College

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Kristine Sudbeck
Chief Academic Officer, Nebraska Indian Community College

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Lyle Kathol
Chief Academic Officer, Northeast Community College

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Dennis Headrick
Chief Academic Officer, Southeast Community College

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Kim Kuster Dale
Chief Academic Officer, Western Nebraska Community College

Adopt
I. CATALOG DESCRIPTION
Course Number: BIOS 2460
Course Title: Microbiology
Prerequisite(s): General Biology (BIOS1010) or department approval.

Catalog Description: Study of microbiology with emphasis on structure of microbial cells, their nutrition and growth, control of growth, genetics and genetic engineering, metabolic and biosynthesis activity, and host-parasite interactions. Accompanying laboratory study emphasizes microbiological techniques including microbial control and manipulation.

Credit Hours: 4.0 semester
6.0 quarter
Lecture / Classroom Hours: 3 hours / week (semester)
5 hours / week (quarter)
Laboratory Hours: 2 hours / week (semester)
3 hours / week (quarter)

II. COURSE OBJECTIVES / COMPETENCIES
Course will:
1. Recognize the various microorganisms and explain their relationships to each other and to other organisms.
2. Explain the physiological processes used by microorganisms and explain their relationships to other organisms.
3. Describe the reproductive processes of microorganisms
4. Understand the practical use of modern controlling methods.
5. Explain both naturally-occurring and artificial methods of protecting the body against disease.
6. Explain the effects of diseases organisms have on the normal anatomy and physiology of the body.
7. Describe techniques used in genetic engineering and discuss applications.
8. Differentiate the energy gathering and production methods and discuss their applications in microbiology.

III. STUDENT LEARNING OUTCOMES:
Students will be able to:
1. Know the basic history of microbiology and list some important scientists which were involved.
2. Be proficient in basic laboratory techniques such as; microscopy, staining techniques, microbial transfer, and bacterial metabolism.
3. Explain the differences and similarities in prokaryotic cell, eukaryotic cell, prion, and viral structure and function.
4. Differentiate microbial preferences including their non-environmental conditions.
5. Explain microbial genetics including expression, recombination, and transformation.
6. Differentiate techniques used in genetic engineering.
7. Know modern methods of microbial control and resistance.
8. Know methods which minimize pathogen transmission.
9. Explain the processes of the immune system.
10. Know modern taxonomy.

IV. COURSE CONTENT / TOPICAL OUTLINE
1. Microbial structure and classification.
2. Growth and development, ecological relationships, and metabolic processes of microorganisms.
3. Reproduction including genetic coding, viruses, and biotechnology.
4. Microbial control and immunity.
5. Principles of disease and its effects on body systems.

V. INSTRUCTIONAL MATERIALS
A. Required Text(s) Suggested
   5. MICROBIOLOGY: A SYSTEMS APPROACH, 4TH EDITION or newer, M. K. COWAN, K. TALARO, 2015. MCGRAW-HILL PUBLISHING
   6. LABORATORY APPLICATIONS IN MICROBIOLOGY, 3RD EDITION or newer, BARRY CHESS, 2015, MCGRAW-HILL PUBLISHING
   8. Microbiology, 2017 or newer, Open Stax, publisher by Rice University

B. Suggested

VI. METHOD OF PRESENTATION/INSTRUCTION
Methods of presentation typically include a combination of the following
1. Lecture
2. Lab
3. Demonstration
4. Group activities
5. On-Line
6. Distance Education
VII. METHODS OF EVALUATION
Course grades, at the determination of the instructor, will be based on participation, assignments, exams, presentations, papers and/or a portfolio. Instructors will distribute and discuss evaluation and his/her grading policies with students at the beginning of each term.

VIII. INSTITUTIONAL DEFINED SECTION
(To be used at the discretion of each community college as deemed necessary)