Northern Marianas College
CURRICULUM ACTION REQUEST

Effective Semester / Session: Fall 2023

Type of Action:

__ New
X Modification
__ Move to Inactive (Stop Out)
__ Cancellation

Course Alpha and Number: BI 225

Course Title: Basic Microbiology

Reason for initiating, revising, or canceling:
Additional compensation of 1 credit is being added to the course guide for the extra time and effort associated with the lab preparation.

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Florita Cabanes — Sep 12, 2023

Proposer — Date

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Academic Council Vice Chair — Date

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Interim Dean of Academic Programs and Services — Date

1. **Department**
   Science, Math, Health, and Athletics

2. **Purpose**
   This course will provide information on the importance of microorganisms to humankind, the importance of microbiology to society, and a concern towards good hygiene, sanitary food preparation, and a clean environment. The principles learned in this course are relevant in understanding the disease process and control of microorganisms.

3. **Description**
   A. **Required/Recommended Textbook(s) and Related Materials**
      Required:
      Anderson, D., Salm, S., & Allen, D. (2019). *Microbiology: A human perspective* (9th edition). New York: McGraw-Hill Companies, Inc.

      Kleyn, J., Oller, A. (2019). *Microbiology Experiments: A Health Science Perspective* (9th edition). New York: McGraw-Hill Companies, Inc.

   B. **Contact Hours**
      1. **Lecture:** 3 per week / 45 per semester
      2. **Lab:** 3 hours per week / 45 hours per semester
      3. **Other:** N/A

   C. **Credits**
      1. **Number:** 4
      2. **Type:** Regular degree credits

   D. **Catalogue Course Description**
      This is a survey course covering the major groups of microorganisms in relation to their classification, characteristics, and medical importance. Microbiology introduces students to related topics in immunology and epidemiology. It is intended for students entering the fields of professional health care, although other students may wish to enroll in the course. Laboratory and field trips are required. Prerequisite: A “C” grade or higher in BI 101. English Placement Level: EN 101. Math Placement Level: MA 132. (Offered Spring)

E. Degree or Certificate Requirements Met by Course
This course serves as a required course for the Nursing Degree Program or may serve as an elective course for non-nursing students.

F. Course Activities and Design
This course includes lectures, discussions, group work, laboratory activities, homework and web-based assignments, video and PowerPoint presentations, quizzes, tests, field trips, research projects and oral presentations.

4. Course Prerequisite(s); Concurrent Course Enrollment
Prerequisites: BI 101 with a "C" grade or better
Concurrent Course Enrollment: None

Required English/Mathematics Proficiency Level(s):
English Placement Level: EN 101
Mathematics Placement Level: MA 132

5. Estimated Cost of Course; Instructional Resources Needed
Cost to the Student: Tuition for a 4-credit hour course, textbook and laboratory manual, laboratory fee, research project materials.

Cost to the College: Instructor's salary for 5 credits, encompassing 4 credits plus an additional 1 course credits to accommodate the instruction of a science lab.

Instructional resources needed for this course include replacement of expendable laboratory materials, chemicals, and equipment; whiteboard and pen; computer; internet connection; and reference materials.

6. Method of Evaluation
Student grades will be based on assignments, quizzes, tests, projects, presentations, laboratory activities and reports. NMC's grading and attendance policies will be followed.

7. Course Outline

This is a topical outline and does not necessarily indicate the sequence in which the material will be presented.

1.0 Life and Death of Microorganisms
- 1.1 Dynamics of prokaryotic growth
- 1.2 Control of microbial growth
- 1.3 Fueling cell growth
- 1.4 The DNA and biotechnology

2.0 The Microbial World
- 2.1 Identification and classification of prokaryotic organisms
- 2.2 The diversity of prokaryotic organisms
- 2.3 The eukaryotic members of the microbial world
- 2.4 Viruses of bacteria
- 2.5 Infectious agents of animals and plants

3.0 Microorganisms and Humans
- 3.1 The immune response and applications
- 3.2 Host-microbe interactions
- 3.3 Immunologic disorders
- 3.4 Epidemiology
- 3.5 Antimicrobial medications

4.0 Infectious Diseases in the Body
- 4.1 Respiratory system infections
- 4.2 Skin and wound infections
- 4.3 Digestive system infections
- 4.4 Genitourinary tract infections
- 4.5 Nervous system infections
- 4.6 Blood and lymphatic infections

5.0 Applied Microbiology
- 5.1 Microbial ecology
- 5.2 Treatment of water, wastes, and polluted habitats
- 5.3 Food microbiology

8. Instructional Goals

The course will introduce students to:

1.0 Selected laboratory techniques in the study and identification of microbes;

2.0 The human perspective of the microbial world;

3.0 Dynamics and control of microorganism growth;

4.0 Classification of microbes;

5.0 Diversity of prokaryotic organisms and eukaryotic members in the microbial world;

6.0 The innate and adaptive immune responses of the human body and their applications;

7.0 Concepts in epidemiology;

8.0 Types of infectious diseases in the human body; and

9.0 Applications of microbiology in the field of ecology, in the study of food, and in various environmental conditions.

9. Student Learning Outcomes

Upon successful completion of this course, students will be able to:

1.0 Summarize the history of microbiology and theories that explain the origins of microorganisms;

2.0 Compare the different methods in identification of prokaryotes;

3.0 Apply the proper materials and methods in the sampling, culture, isolation, observation of microorganisms;

4.0 Illustrate the structures of prokaryotic and eukaryotic cells to describe their functions;

5.0 Describe the bases of classifying microbes;

6.0 Explain the physical and chemical control of microbial growth;

7.0 Describe the development of microbe drug resistance;

8.0 Explain vaccine production, the benefits of immunization, and its hazards;

9.0 Outline the epidemiological principles that may be used in tracking the transmission and spread of a disease-causing pathogen; and

10.0 Describe the importance of microbes in agriculture, food production, industry and ecosystem, and how contamination can be prevented.

10. Assessment Measures of Student Learning Outcomes

Assessment of student learning may include, but not be limited to, the following:

1.0 Assignments;

2.0 Quizzes;

3.0 Test;

4.0 Laboratory exercises and reports;

5.0 Cumulative final exam; and

6.0 Research project.

Course Guide BI 225 for Fall 2023

Final Audit Report 2023-09-13

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