Northern Marianas College
CURRICULUM ACTION REQUEST

Effective Semester / Session: Summer 2022

Type of Action:

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

Course Alpha and Number: BI141

Course Title: Plant Science

Reason for initiating, revising, or canceling:
This course guide is being modified for change in credit hours.

Velma C. Deleon Guerrero 2/22/2022

Proposer Date

Velma C. Deleon-Guerrero 2/22/2022

Department Chair Date

Adam Walsh 02.15.22

Language & Format Review Specialist Date

Ajani Burrell 02.15.2022

Academic Council Chair Date

Vilma S. Reyes 02/22/22

Interim-Dean of Learning & Student Success Date

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

2. **Purpose**
   Plant Science focuses on the scientific discipline of plant biology.

3. **Description**

   A. **Required/Recommended Textbook(s) and Related Materials**
   Required:
   Mauseth, James D. *Botany: An Introduction to Plant Biology*. 7th ed. Sudbury, MA: Jones & Bartley Publishers, 2019.

   Recommended:
   Whistler, W. Arthur. Wayside Plants of the Islands: A Guide to the Lowland Flora of the Pacific Islands. Honolulu, HI: Isle Botanica, 1995.

   Vogt, Scott R. and Williams, Laura L: Common Flora and Fauna of the Mariana Islands.1st ed. Laura L. Williams and Scott R. Vogt Publishers, 2018.

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

   C. **Credits**
   1. **Number:** 4
   2. **Type:** Regular Degree Credits

   D. **Catalogue Course Description**
   This course introduces students to the study of plant life to illustrate the fundamental principles of plant ecology. Topics will cover cellular organization, photosynthesis, respiration, growth and development, reproduction, mineral nutrition and water absorption, Marianas plant diversity and ecology, and human uses of plants. Laboratory and field trips are required. English Placement Level: EN101. Math Placement Level: MA091. (Offered Fall and Spring).

   E. **Degree or Certificate Requirements Met by Course**
   A grade of "C" or higher in this course fulfills an elective requirement for any A.S degree with a science major and satisfies the science elective option for non-majors.

F. Course Activities and Design
This course includes lectures, group work, discussions, laboratory activities, homework, web-based assignments, viewing audio-visual materials, periodic quizzes, tests, field trips, comprehensive final exam, and research projects that require presentations.

4. Course Prerequisite(s); Concurrent Course Enrollment
Prerequisites: None
Concurrent Course Enrollment: None

Required English/Mathematics Proficiency Level(s)
English Placement Level: EN101
Mathematics Placement Level: MA091

5. Estimated Cost of Course; Instructional Resources Needed
Cost to the Student: Tuition for a 4-credit course; cost of the textbooks; lab fee; and instructional materials fee.

Cost to the College: Instructor's salary

Instructional resources needed for this course include: classroom and laboratory-equipped space; whiteboard and pen; audio-visual programs/software; multimedia projectors; various laboratory materials, chemicals, and equipment.

6. Method of Evaluation
Students learning will be assessed on the basis of class attendance and participation, homework completion, in-class and online quizzes, midterm and final exams, and presentations. For laboratory activities, students will be evaluated on the basis of attendance, laboratory exercise completion and laboratory pre- and post-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 Introduction to plant science
- 1.1 Scientific method
- 1.2 Principles of chemistry
- 1.3 Principles of biology
- 1.4 What is "botany"

2.0 Plant Structure
- 2.1 Cell structure
- 2.2 Growth and division of the cell
- 2.3 Tissues and primary growth of stems
- 2.4 Leaves
- 2.5 Roots
- 2.6 Woody plants
- 2.7 Flowers and reproduction

3.0 Plant Physiology
- 3.1 Photosynthesis
- 3.2 Respiration
- 3.3 Transport processes
- 3.4 Soils and mineral nutrition
- 3.5 Development and morphogenesis
- 3.6 Metabolism

4.0 Genetics/Evolution
- 4.1 Genetics
- 4.2 Population genetics/evolution
- 4.3 Classification/Systematic
- 4.4 Prokaryotes
- 4.5 Fungi
- 4.6 Nonvascular plants
- 4.7 Vascular plants without seeds
- 4.8 Gymnosperms
- 4.9 Angiosperms

5.0 Plant Ecology
- 5.1 Plant population growth
- 5.2 Plants unique role in ecosystems
- 5.3 Keystone and invasive species
- 5.4 Plant diversity across biomes

6.0 Plants of the Pacific Islands and Northern Marianas
- 6.1 Biogeography
- 6.2 Terrestrial diversity
- 6.3 Marine diversity
- 6.4 Culturally important species

8. Instructional Goals

The course will introduce students to:

1.0 The influence of plant on our planet, environment, and society;

2.0 The structure of plants and their functions;

3.0 Physiological processes of plants and their functions;

4.0 The basics of plant-based genetics and evolution;

5.0 Classifications and systematics of plants;

6.0 The native flora of the Mariana Islands and other Pacific islands; and

7.0 Current plant science research areas.

9. Student Learning Outcomes

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

1.0 Demonstrate an understanding of the influence of plants on our planet, environment, and society;

2.0 Characterize the structure of plants and their functions;

3.0 Discuss the basics of plant genetics and evolution;

4.0 Scientifically classify plants;

5.0 Perform identification techniques;

6.0 Demonstrate familiarity with the native plant species found in the Pacific Region; and

7.0 Discuss the most current plant science research areas.

10. Assessment Measures of Student Learning Outcomes

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

1.0 Quizzes;

2.0 Exams;

3.0 Homework;

4.0 Laboratory/Research reports;

5.0 Presentations; and

6.0 Projects.