

Northern Marianas College
CURRICULUM ACTION REQUEST

Effective Semester / Session: Spring 2012

Type of Action:

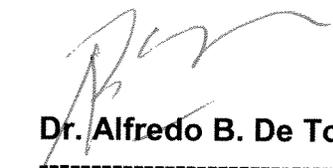
- New
- Modification
- Move to Inactive (Stop Out)
- Cancellation

Course Alpha and Number: BI 201

Course Title: Natural History of the Mariana Islands

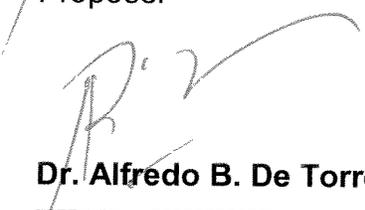
Reason for initiating, revising, or canceling:

This course guide is being modified for periodic updates.


Dr. Alfredo B. De Torres

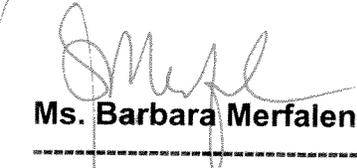
Proposer

23 Feb 12
Date


Dr. Alfredo B. De Torres

Department Chair

23 Feb 12
Date


Ms. Barbara Merfalen

Dean of Academic Programs and Services

2-23-12
Date

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Course Guide

Course: BI 201 Natural History of the Mariana Islands

1. Department

Sciences, Mathematics, Health and Athletics

2. Purpose

The purpose of this course is to introduce the student to the natural history of the Mariana Islands. Topics covered include the geology and evolution of the Mariana Islands; the climate in the Mariana Islands; coral reef structure and evolution; what organisms live on, and in the waters surrounding the Commonwealth of the Northern Mariana Islands (CNMI); groundwater resources; and human use of resources. Students will also learn how organisms are classified, how they contribute to their environment, about environmental influences on organisms, and how organisms change with time. This course will emphasize independent learning and exploration of the natural history of the Mariana Islands through lab activities and field trips.

3. Description

A. Required/Recommended Textbook(s) and Related Materials

Required:

Furey, John, et. al. *Island Ecology & Resource Management*. Saipan, MP: Northern Marianas College Press, 2006.

Readability level: Grade 10

B. Contact Hours

1. **Lecture:** 3 hours per week / 45 per semester

2. **Lab:** 3 hours per week / 45 per semester

3. **Other:**

C. Credits

1. **Number:** 4, including 1 credit of science lab

2. **Type:** Regular degree credits

D. Catalogue Course Description

This is a natural history survey course covering geology, ecology, and flora and fauna of the Mariana Islands. Laboratory and field trips are required. As part of the field trips, swimming or hiking may be required. Prerequisite: None. English Placement Level: EN 093/094. Math Placement Level: MA 091.

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E. Degree or Certificate Requirements Met by Course

Successful completion of this course satisfies a course requirement in biological science for an NMC associate-level degree program.

F. Course Activities and Design

Course activities include lecture, group discussions, homework assignments, viewing relevant audio-visual material, field trips, laboratory exercises, tests, quizzes, and/or a final exam. Students will be required to participate fully in class discussions, student projects, writing activities, and other course assignments, depending upon the individual instructor.

4. Course Prerequisite(s); Concurrent Course Enrollment; Required English/Mathematics Placement Level(s)

Prerequisite(s): None

English Placement Level: EN 093/094

Math Placement Level: MA 091

5. Estimated Cost of Course; Instructional Resources Needed

Cost to the Student: Tuition for a 4-credit course; cost of textbook and laboratory materials.

Cost to the College: Instructor's salary.

Instructional resources needed for this course include availability or access to computers, software, and computer projector system; TV, VCR-DVD player, chalk, chalkboard, or whiteboard markers and whiteboard.

6. Method of Evaluation

Student grades will be based on the regular letter grade system as described below:

A: Excellent – grade points: 4.0;

B: Above average – grade points: 3.0;

C: Average – grade points: 2.0;

D: Below average – grade points: 1.0;

F: Failure – grade points: 0.0.

NMC's grading and attendance policies will be followed.

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7. Course Outline

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

- 1.0 Geographic Features of the Mariana Islands
 - 1.1 Physical location of the Mariana Islands
 - 1.2 Island types
 - 1.3 Island features
- 2.0 Geology of the Mariana Islands
 - 2.1 Plate Tectonics
 - 2.2 Volcanism
 - 2.3 Island arcs
 - 2.4 Island evolution
 - 2.5 Rocks and minerals
 - 2.6 Erosion and weathering
 - 2.7 Soils
- 3.0 Meteorology
 - 3.1 Causes of seasons
 - 3.2 Climate of the Mariana Islands
 - 3.3 Weather and storms
- 4.0 Freshwater Resources
 - 4.1 Hydrological cycle
 - 4.2 Aquifers
 - 4.3 Streams and lakes
- 5.0 Oceans
 - 5.1 Composition of seawater
 - 5.2 Geographic and geological features
 - 5.3 Currents, waves and tides
 - 5.4 Life zones
- 6.0 Organisms and Islands
 - 6.1 Methods for organism transport to islands
 - 6.2 Changes that occur to organisms
 - 6.3 Endemic, native, and introduced species
 - 6.4 Invasive species
 - 6.5 Endangered species
 - 6.6 Succession
 - 6.7 Biogeochemical cycles

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- 7.0 Biomes and Ecosystems
- 8.0 Mariana Island Communities
 - 8.1 Oceanic communities
 - 8.1.1 Open ocean
 - 8.1.2 Coral reefs
 - 8.1.3 Intertidal zone
 - 8.2 Wetland communities
 - 8.2.1 Oceanic influenced wetlands
 - 8.2.2 Freshwater and brackish water wetlands
 - 8.2.3 Ravine communities
 - 8.3 Coastal strand
 - 8.4 Savanna
 - 8.5 Forests
 - 8.6 Disturbed ground communities
- 9.0 Human Influences in the Mariana Islands
 - 9.1 Cultural history of the Mariana Islands
 - 9.2 Aesthetic value of nature
 - 9.3 Community and resource management

8. Instructional Goals

This course will introduce students to:

- 1.0 The vocabulary and language used in the study of natural history;
- 2.0 The use of scientific names for animals and plants;
- 3.0 The uses of keys and field guides for identifying organisms;
- 4.0 The importance of climate, weather, and storms in developing soils, communities and ecosystems;
- 5.0 The different natural communities found in the Mariana Islands;
- 6.0 The common organisms found in the Mariana Islands;
- 7.0 Endemic, native, introduced, endangered and invasive species;
- 8.0 Biological evolution, and how it forms and changes species;
- 9.0 The importance of coral reefs to tropical islands;

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- 10.0 The life cycle of coral reef organisms and other marine organisms;
- 11.0 The importance of freshwater to organisms on islands and available freshwater resources;
- 12.0 The theory of Plate Tectonics and how it relates to the Mariana Islands;
- 13.0 The basic geology of the Mariana Islands;
- 14.0 An appreciation for the esthetic value of nature; and
- 15.0 The influence of humans on natural ecosystems.

9. Student Learning Outcomes

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

- 1.0 Understand and effectively use the vocabulary and language of natural history, and know the definitions of common terms used in natural history as applied to:
 - a) ecology and ecosystems;
 - b) general biology;
 - c) geology; and
 - d) resource management;
- 2.0 Use scientific names when describing common plants and animals correctly, and also be able to explain:
 - a) the importance of the use of scientific names in the study of biology; and
 - b) how scientific names show evolutionary relationships;
- 3.0 Use and construct dichotomous keys for the identification of plants and animals, in addition to using field guides;
- 4.0 Explain the relationship between climate, soil and the ecological community found in a given area;
- 5.0 Recognize and identify the different ecological communities in the Northern Mariana Islands;

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- 6.0 Identify common plants and animals that are found in the Mariana Islands;
 - 7.0 Explain, in terms of biological evolution, how a species can become:
 - a) endangered;
 - b) endemic; or
 - c) invasive;
 - 8.0 Describe mechanisms that may cause a species to change with time, and how limited resources and competition found on islands may influence the evolution of a species;
 - 9.0 Explain the development of coral reefs and their importance to tropical Islands;
 - 10.0 Diagram the life cycles of common coral reef and other marine organisms;
 - 11.0 Explain the importance of freshwater to organisms on an island and how this important resource is stored and recycled on islands;
 - 12.0 Describe the origins of the Mariana Islands in relationship to Plate Tectonic Theory and how they change with time;
 - 13.0 Use the theory of Plate Tectonics to explain the geological features found in or near the Mariana Islands, and why these islands are located where they are in the Pacific Ocean;
 - 14.0 Explain how aesthetics can be used to place a value on organisms and ecosystems; and
 - 15.0 Use modeling and management concepts to explain how natural communities might best be used by people, while at the same time preserving as much of the community, as possible, in its natural state.
- 10. Assessment Measures**
- Assessment of student learning may include, but not be limited to, the following:
- 1.0 Periodic testing and a final examination to evaluate the student's knowledge in relationship to the topics discussed in this course.

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- 2.0 A research project using the basic concepts from this course as they relate to the Mariana Islands.
- 3.0 A student presentation on some aspect of the natural history of the Mariana Islands.