

# Northern Marianas College

## CURRICULUM ACTION REQUEST

**Effective Semester / Session:** Fall 2021

**Type of Action:**

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

**Course Alpha and Number:** NS140

**Course Title:** Earth and Environmental Science

**Reason for initiating, revising, or canceling:**

This course guide is being modified as an update to support the creation of an AA in Liberal Arts with an emphasis in pre-engineering for students who may choose a career in engineering. This update will also provide another science course that students can take in fulfillment of their respective IDPs.



Velma C. Deleon Guerrero

5/19/2021

Proposer

Date



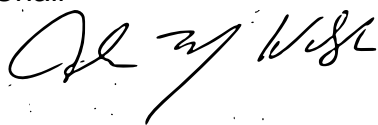
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5/19/2021

Department Chair

Date

Adam Walsh



05.19.21

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5.19.2021

Academic Council Chair

Date

Charlotte Cepeda



05/26/2021

Dean of Learning & Student Success

Date

# Northern Marianas College

## Course Guide

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Course: NS140 Earth and Environmental Science

### 1. Department

Sciences, Mathematics, Health & Athletics

### 2. Purpose

The purpose of this course is to meet the degree requirements for the AA in Liberal Arts with an emphasis in Pre-Engineering. This course will also offer an alternative physical science or elective requirement.

### 3. Description

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

Required:

Hendrix, Marc and Thompson, Graham. *Earth Science: An Introduction*, 3rd Edition. Cengage Learning Custom Publishing, 2021.

Recommended: None

#### B. Contact Hours

1. **Lecture:** 3 per week / 45 per semester
2. **Lab:** 3 per week / 45 per semester
3. **Other:** None

#### C. Credits

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

#### D. Catalogue Course Description

This course is designed to be an introductory tour of the Earth, its physical environment, and its place in the universe. This course will cover the foundations of geology, geophysics, oceanography, planetary science, and meteorology. This course will investigate the origins, physical properties, and dynamics of the Earth as an integrated system. Students will participate in discussion and conduct hands-on investigations in the laboratory. Prerequisite: MA091 and EN095. (Offered Fall and Spring.)

#### E. Degree or Certificate Requirements Met by Course

A grade of "C" or higher in this course fulfills the degree requirement for the AA in Liberal Arts with an emphasis in pre-engineering and satisfies the science elective option for non-majors.

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**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 with 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; and 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, presentation, midterm and final exams. 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.

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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 Earth Materials and Time
  - 1.1 Minerals
  - 1.2 Rocks
  - 1.3 Creation
  - 1.4 Geologic time
  - 1.5 Geologic resources
  
- 2.0 Internal Process
  - 2.1 Plate tectonics
  - 2.2 Earthquakes and structure
  - 2.3 Volcanoes and plutons
  - 2.4 Mountains
  
- 3.0 Surface Process
  - 3.1 Weathering, soil, and erosion
  - 3.2 Fresh water
  - 3.3 Water resources
  - 3.4 Glaciers and ice age
  - 3.5 Deserts and wind
  
- 4.0 Oceans
  - 4.1 Ocean basins
  - 4.2 Oceans and coastlines
  
- 5.0 Atmosphere
  - 5.1 Energy balance in the atmosphere
  - 5.2 Moisture, clouds, and weather
  - 5.3 Climate
  - 5.4 Climate change
  
- 6.0 Astronomy
  - 6.1 Motions in the heaven
  - 6.2 Planets and their moons
  - 6.3 Stars, space, and galaxies
  
- 7.0 Global and Dynamic Ocean
  - 7.1 Ocean floor and oceanic ridge (mid-ocean ridge)
  - 7.2 Currents and water mass
  - 7.3 Surface and deep-ocean circulation
  - 7.4 Waves and tides

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**8. Instructional Goals**

The course will introduce students to:

- 1.0 The fundamental processes involved in the global Earth system;
- 2.0 The history of the Earth and the principles used in determining its age;
- 3.0 Interactions, called “cycles” between the solid Earth, its oceans, atmosphere, and biosphere;
- 4.0 Physical models of the Earth and the physical forces that form and shape the Earth;
- 5.0 The dynamics of earthquakes, volcanic eruptions, tidal waves, and groundwater contamination;
- 6.0 The principles of plate tectonics;
- 7.0 The scope of geology, the different rock types based on how they were formed, and the processes used in determining these rock types;
- 8.0 The process of weathering, erosion, deposition, and mass wasting;
- 9.0 The composition and dynamics of the Earth’s oceans, atmosphere, weather, climate, and other celestial bodies in the universe; and
- 10.0 Techniques of envisioning earth science from an integrated global perspective.

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**9. Student Learning Outcomes**

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

- 1.0 Explain the fundamental processes involved in the global earth system;
- 2.0 Describe the history of the Earth;
- 3.0 Explain the principles used in determining its age;
- 4.0 Describe the natural interactions, called “cycles” between the solid Earth, its oceans, atmosphere, and biosphere;
- 5.0 Use physical models of the Earth to describe the physical forces that form and shape the Earth;
- 6.0 Explain the principles of plate tectonics;
- 7.0 State the definition and scope of geology;
- 8.0 Describe the processes used in determining the three types of rocks based on how they were formed;
- 9.0 Explain the processes of weathering, erosion, deposition, and mass wasting; and
- 10.0 Describe the composition and dynamics of the Earth’s oceans, atmosphere, weather, climate, earthquakes, volcanic eruptions, tidal waves, and groundwater contamination.

**10. Assessment Measures of Student Learning Outcomes**

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

- 1.0 Tests and Quizzes;
- 2.0 Laboratory/Research Report;
- 3.0 Homework;
- 4.0 Presentation;
- 5.0 Project; and
- 6.0 Final Exam