

Northern Marianas College
CURRICULUM ACTION REQUEST

Effective Semester / Session: Fall 2018

Type of Action:


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


Course Alpha and Number: BI106


Course Title: Agricultural Science


Reason for initiating, revising, or canceling:


This course has been modified for periodic updates, changes to required readings, and adaptation for online delivery as part of the USDA NIFA Distance Education Grants for Insular Areas.

Dr. Donald D. Rayome  9 Apr 2018
Proposer Date

Velma C. Deleon Guerrero  4/3/2018
Department Chair Date

Adam Walsh  APRIL 3, 2018
Language & Format Review Specialist Date

Ajani Burrell  4/3/18
Academic Council Chair Date

Amanda Angel-Diaz  4/10/2018
Acting Dean of Learning & Support Services Date

Course: BI106

1. Department

Sciences, Mathematics, Health, and Athletics

2. Purpose

Agricultural Science focuses on the various scientific and practical aspects of agriculture ranging from historical origins to modern techniques. BI 106 provides a foundation in agriculture while emphasizing its importance to humans and our environment. Topics include introductions to soil science, plant characteristics, nutrient management, pests and diseases, chemical use, climate and seasons, animal husbandry, aquaculture and hydroponics, agroforestry, conservation management, biofuels and non-food crops, and markets.

3. Description

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

Required:

Textbooks are not required for this course. Instructor will provide all readings, scholarly journal articles, and other written materials to accompany course lectures in accordance with the NMC Library and other student resources. All course readings will be available on the Moodle course website.

Recommended:

Herren, Ray. *The Science of Agriculture: A Biological Approach, 5th Edition*
Cengage Learning, 2018.

B. Contact Hours

1. **Lecture:** Students are expected to spend a minimum of 3 hours per week on the BI 106 online course website at 3hrs/week or 45hrs/semester.
2. **Lab:** N/A
3. **Other:** N/A

C. Credits

1. **Number:** 3
2. **Type:** Regular degree credits

D. Catalogue Course Description

This course provides an overview of agriculture as a science and its practical application. The historical background and functions of agriculture as they affect human society and the environment will be a central focus of the course. Topics will include domesticating plants; animal and aquaculture production; pest management; forestry and grassland management; soil science; nutrient control and chemical use; seasonal and climate changes; restoration and conservation practices; and advances including precision, biotechnology, and biofuels.

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Prerequisite: BI 101. English Placement Level: EN 101. Math Placement Level: MA 091.

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 in Natural Resources Management and satisfies the science elective option for non-majors.

F. Course Activities and Design

This course option is being taught using a Distance Learning Format (online) Internet based Instruction. Each Student will be required to access the Internet to participate as a student in this class. There will be many different learning activities provided each week (journal articles, popular science readings, assignments to be submitted through the course website, discussion forums, etc.). Students are responsible for keeping up with the assignments on a weekly basis and adhering to the designated due dates. As this course is offered in an asynchronous distance learning format, students can complete weekly readings and assignments any time during the week; however, all readings and assignments need to be completed by the designated due date (ample time is given between assignments and managing time is each student's responsibility). Assignment due dates are outlined in the Monthly Calendar as well as on the online class site. Projects, group interactions, and research are all designed to stimulate discussion and learning while providing skills in the application of knowledge gained from this course.

4. Course Prerequisite(s); Concurrent Course Enrollment

Prerequisites: A passing grade in BI101

Required English/Mathematics Proficiency Level(s)

Prerequisites: BI101 of Department Chair and Instructor permission

Concurrent Course Enrollment: N/A

English Placement Level: EN101

Mathematics Placement Level: MA091

5. Estimated Cost of Course; Instructional Resources Needed

Cost to the Student: Tuition for a 3-credit hour course, student flat fee, and instructional materials fee.

Cost to the College: Instructor's salary.

Instructional resources needed for this course include internet access, course webpage access, library and archives resource access, outdoor access for soil collection and optional farm / agriculture production facility tours (NMC-CREES Saipan, Tinian, and Rota facilities suggested).

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6. Method of Evaluation

Student learning will be evaluated on the basis of class participation, oral presentations, assignments, class project, lab/field reports, quizzes, exams, and a comprehensive final exam.

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 grading policies will be followed. NMC attendance policies will be followed as appropriate for Distance Learning Format (online) Internet based Instruction

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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 Introduction to the History of Agriculture
 - 1.1 Hunter-gathers to farmers
 - 1.2. Centers of Transition
 - 1.3 Rise of cities and empires
 - 1.4 Major advances in agriculture

- 2.0 Introduction to Soils and Hydrology
 - 2.1 Physical traits
 - 2.2 Hydrology
 - 2.3 Nutrients in the soil
 - 2.4 What lives in the soil?
 - 2.5 Nutrient management and soil building
 - 2.6 Cover crops, compost, and manure

- 3.0 Production
 - 3.1 Cultivation scale and intensity
 - 3.2 Seasonal land management
 - 3.3 Relay crops, interplanting, and interactions
 - 3.4 Herbicides, pesticides, and chemical use
 - 3.5 Vulnerability and sustainability
 - 3.6 Long-term effects and alternatives
 - 3.7 Climate change in the tropics

- 4.0 Domestication
 - 4.1 Wild relatives
 - 4.2 Domesticating plants and animals
 - 4.3 Genetics and breeding
 - 4.4 Cultivars, varieties, heirlooms, and hybrids
 - 4.5 Genetic engineering

- 5.0 Types of Agriculture
 - 5.1 Precision and integrated pest management
 - 5.2 Horticulture and vegetables
 - 5.3 Tree crops and agroforestry
 - 5.4 Forestry and silviculture
 - 5.5 Agro-ecology, restoration, and conservation
 - 5.6 Dairying and egg production
 - 5.7 Grassland and grazing management
 - 5.8 Hydroponics, aquaponics, and aquaculture
 - 5.9 Combined system and integration

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- 6.0 Agriculture and Society Today
 - 6.1 Rural communities and urban centers
 - 6.2 Effects of diet and eating locally
 - 6.3 Alternative and non-food crops
 - 6.4 Medicines, fiber, and biofuels
 - 6.5 Science and technology
 - 6.6 career opportunities and agriculture

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8. Instructional Goals

The course will introduce students to:

- 1.0 The various disciplines of agriculture;
- 2.0 The history of agriculture and major shifts through time;
- 3.0 Soils and properties essential to agriculture;
- 4.0 Production agriculture, from hand-labor to machinery;
- 5.0 Use of plants and animals to meet our needs;
- 6.0 Chemical uses including fertilizers, herbicides, and pesticides;
- 7.0 Domestication, genetics, and genetic engineering;
- 8.0 Types of agriculture practiced today; and
- 9.0 The effects of agriculture on people and our world.

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9. Student Learning Outcomes

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

- 1.0 Discuss agriculture and its various disciplines;
- 2.0 Describe the history of agriculture and major shifts through time;
- 3.0 Explain what properties of soil are essential to agriculture;
- 4.0 Detail the progression of agriculture and hand-labor to machinery;
- 5.0 Explain how and why we use plants and animals to meet our needs;
- 6.0 Identify chemical uses including fertilizers and pest controls;
- 7.0 Define domestication, genetics, and genetic engineering
- 8.0 Describe the types of agriculture practiced today; and
- 9.0 Illustrate the effects of agriculture on people and the world.

10. Assessment Measures of Student Learning Outcomes

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

- 1.0 Participation, including weekly reading feedback;
- 2.0 Quizzes, midterm test, and final exam;
- 3.0 Researched reports; and
- 4.0 Researched multimedia projects.