

**Northern Marianas College**  
**CURRICULUM ACTION REQUEST**

Course: BI106 Agriculture Science

**Effective Semester / Session:** Spring 2022

**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 to include the lab to accommodate the requirements of the Associate of Science in Agriculture degree for the students who may choose a career in agriculture and related sectors.

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Dr. Virendra M. Verma 	10/19/2021
<b>Proposer</b>	Date
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Velma C. Deleon Guerrero 	10/19/2021
<b>Department Chair</b>	Date
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Adam Walsh 	10.18.21
<b>Language &amp; Format Review Specialist</b>	Date
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Ajani Burrell 	10.19.2021
<b>Academic Council Chair</b>	Date
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Dr. Randy Yates 	19 Oct 21
<b>Dean of Academic Programs and Services</b>	Date

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Course: BI106 Agriculture Science

## 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, 5<sup>th</sup> Edition*  
Cengage Learning, 2018.

### B. Contact Hours

1. **Lecture:** None
2. **Lab:** 3 per week / 45 per semester
3. **Other:** Online, asynchronous course work equivalent to 3 per week / 45 per semester.

### C. Credits

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

### D. Catalogue Course Description

This course option is being taught in a distance learning format (online) using 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, such as chapter readings, 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

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in an asynchronous distance learning format, students can complete weekly readings and assignments any time during the week. Reflections, discussion forums, and labs are all designed to stimulate discussion and learning while providing skills in the application of knowledge gained from this course  
Prerequisite: BI101. English Placement Level: EN101. Math Placement Level: MA091.

### **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 in a distance learning format (online) using 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, such as chapter readings, 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. Reflections, discussion forums, and labs 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: BI101 of Department Chair and Instructor permission

### **Required English/Mathematics Proficiency Level(s)**

Concurrent Course Enrollment: None

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, instructional and lab materials.

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 lab activities and optional farm, agriculture production facility or backyard garden.

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### 6. Method of Evaluation

Student learning will be assessed on the basis of lab work, forum participation, reflection and assignments completion, online quizzes, mid-term and final exams.

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

## 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.

**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 Tests and Quizzes;
- 2.0 Lab Work and Reports;
- 3.0 Forum Participation;
- 4.0 Assignments;
- 5.0 Reflections; and
- 6.0 Final Exam.