

Northern Marianas College
CURRICULUM ACTION REQUEST

Effective Semester / Session: Spring 2012

Type of Action:

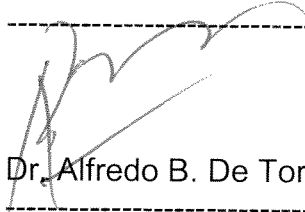
- New
- Modification
- Move to Inactive (Stop Out)
- Cancellation

Course Alpha and Number: BI 106

Course Title: Agricultural Science

Reason for initiating, revising, or canceling:

This course is being modified for periodic updates and addition of recommended textbooks.


Dr. Alfredo B. De Torres

3/5/12

Proposer

Date


Dr. Alfredo B. De Torres

3/5/12

Department Chair

Date


Barbara Merfalen

3-26-12

Dean of Academic Programs and Services

Date

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Course Guide

Course: BI 106 Agricultural Science

1. Department

Sciences, Mathematics, Health and Athletics

2. Purpose

Agricultural Science focuses on the various scientific disciplines in agriculture in order to increase student awareness of the importance of agriculture to humans and our environment. The primary target population for this course consists of students who are enrolled in the A.S. Natural Resources Management degree program. BI 106 is also recommended as an elective to non-majors of NRM, who wish to increase their awareness and an appreciation of and often overlooked Life Science.

3. Description

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

Required:

Herren, Ray V. *The Science of Agriculture, A Biological Approach*. 2nd ed. New York, NY: Thompson Learning, 2002.

Readability level: Grade 10

Recommended:

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

Readability Level: Grade 10

Whistler, W. Arthur. *Flowers of the Pacific Islands Seashore*.

Honolulu, HI: Isle Botanica, 1992.

Readability level: Grade 10

B. Contact Hours

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

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

3. **Other:**

C. Credits

1. **Number:** 4

2. **Type:** Regular degree credits

D. Catalogue Course Description

This course provides an overview of the biology of Agricultural Science. It examines the interdisciplinary functions, the role and impact of animal and plant production on humans, environment and society. Topics will include production fundamentals of food, fiber, and

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medicinal plants; the production of food animals; integrated pest management ecology; aquaculture; forestry; soils; food preservation; biotechnological advances in the discipline; and career opportunities in the agriculture science. Prerequisite: None. English Placement Level: EN 093/094. 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 incorporates lectures, group discussions, resource/guest speakers, audiovisual presentations, student oral presentations, take-home and web-based assignments, a class project, laboratory exercises, field trips, periodic quizzes, exams, and a comprehensive final exam. Students will be required to participate fully in all class activities.

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

Prerequisites: 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, the 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 space, chalkboard/whiteboard and supplies, TV/VCR, videotaped programs, digital camera, video flex camera attachment for microscopes, stereo and compound microscopes, microscope slides and cover slips, overhead projector and transparencies, slide projector, multimedia projector, pruners, soil probes, shovels, buckets, filed implements; plastic bags, glassware and basic laboratory supplies.

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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'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 The Science of Agriculture
 - 1.1 Historical perspective
 - 1.2 Milestones in agricultural research
- 2.0 Soil: The Source of Life
 - 2.1 Soil origins and physical properties
 - 2.2 Soil profiles and taxonomy
 - 2.3 Soil ecosystem and organisms
- 3.0 Cells: Agriculture's Building Blocks
 - 3.1 Cell structure (plant, animal)
 - 3.2 Cellular production
- 4.0 The Science of Genetics
 - 4.1 Gene transfer
 - 4.2 Plant breeding
 - 4.3 Animal breeding
- 5.0 Genetic Engineering
 - 5.1 Gene mapping/splicing
 - 5.2 Social concerns
 - 5.3 Regulation of genetic engineering

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- 6.0 Plant Systems
 - 6.1 Organs and their functions
 - 6.2 Reproduction
 - 6.3 Growth and development

- 7.0 Animal Systems
 - 7.1 Skeletal
 - 7.2 Muscular
 - 7.3 Digestive
 - 7.4 Respiratory
 - 7.5 Circulatory
 - 7.6 Nervous
 - 7.7 Endocrine
 - 7.8 Reproduction

- 8.0 Plant and Animal Diseases and Disorders
 - 8.1 Plant disease/pathogens
 - 8.2 Animal diseases/pathogens
 - 8.3 Animal immune system
 - 8.4 Management/control

- 9.0 Weed Science
 - 9.1 Classification/characterization of weeds
 - 9.2 Imported/alien species
 - 9.3 Management/control

- 10.0 Agricultural Entomology
 - 10.1 Classification/characterization of insects
 - 10.2 Insect pests
 - 10.3 Management/control

- 11.0 Science of Forestry
 - 11.1 The natural forest
 - 11.2 Production of wood fiber

- 12.0 Science of Aquaculture
 - 12.1 Farming fish
 - 12.2 Water quality

- 13.0 Agriculture and the Environment
 - 13.1 Water pollution
 - 13.2 Depletion of water reserves

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- 14.0 A Safe Food Supply
 - 14.1 Pesticide and chemical residues
 - 14.2 Hormone and antibiotic residues
 - 14.3 Preservatives
 - 14.4 Fat content in food
 - 14.5 Labeling

 - 15.0 Science of Food Preservation
 - 15.1 Causes of spoilage
 - 15.2 Food preservation

 - 16.0 Science of Fiber Production
 - 16.1 Cotton
 - 16.2 Wool
 - 16.3 Silk
 - 16.4 Flax

 - 17.0 New Directions in Agriculture
 - 17.1 Genetic engineering
 - 17.2 Renewable resource
 - 17.3 Biomass
 - 17.4 New uses for old crops
 - 17.5 New agricultural animals
 - 17.6 Farming the ocean
 - 17.7 Sustainable agriculture

 - 18.0 Careers in Agriculture Science
 - 18.1 Careers in plant science
 - 18.2 Careers in the animal sciences
 - 18.3 Careers in natural resources
 - 18.4 Careers food science
 - 18.5 Careers social science
- 8. Instructional Goals**
- This course will introduce students to:
- 1.0 Agriculture as a science and its various disciplines;
 - 2.0 The origin, nature, and properties;
 - 3.0 Plant/animal systems and their functions;
 - 4.0 Production fundamentals of food, fiber, and medicinal plants;

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- 5.0 Production fundamentals of good animals;
- 6.0 The art and science of genetics;
- 7.0 Integrated pest management ecology;
- 8.0 Aquaculture science;
- 9.0 Forestry science;
- 10.0 Food safety and preservation;
- 11.0 Biotechnological advances in agriculture; and
- 12.0 Opportunities in various scientific disciplines and agriculture.

9. Student Learning Outcomes

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

- 1.0 Discuss Agriculture as a science and explain its various disciplines;
- 2.0 Discuss and explain the origin, nature, and properties of soil;
- 3.0 Characteristics of the various plant/animal systems and their functions;
- 4.0 Describe the production fundamentals of food, fiber, and medicinal plants;
- 5.0 Describe the production fundamentals of food animals;
- 6.0 Explain the art and science of genetics;
- 7.0 Explain integrated pest management ecology;
- 8.0 Discuss the science of Aquaculture;
- 9.0 Discuss the science of Forestry;
- 10.0 Demonstrate appropriate food safety and preservation;
- 11.0 Discuss biotechnological advances in agriculture; and

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12.0 Recognize career opportunities in Agriculture Science.

10. **Assessment Measures**

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

1.0 Students are evaluated through classroom participation, quizzes, mid-term test, and final exam, researched written reports, and researched multimedia presentations, recitations and assignments, and projects.