Effective Semester / Session: Spring 2012

Type of Action:
- [ ] New
  X 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

Dr. Alfredo B. De Torres  3/5/12
Department Chair

Barbara Merfalen  3/24/12
Dean of Academic Programs and Services
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:  
   Readability level: Grade 10

   Recommended:
   Readability Level: Grade 10

   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
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.
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
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
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;
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
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.