BARTON COMMUNITY COLLEGE
COURSE SYLLABUS

I. GENERAL COURSE INFORMATION

Course Number: AGRI 1213
Course Title: Introduction to Global Positioning Systems and Precision Agriculture
Credit Hours: 3
Prerequisites: None
Division/Discipline: Workforce Training & Community Education/Agriculture, Crop Protection Program, A.A.S. Agriculture Business Management, A.S. Agriculture
Course Description: This course is designed to provide students a basic understanding of the principles, equipment, and applications of global positioning systems (GPS) and precision agriculture technologies currently used and under development for crop production.

II. INSTRUCTOR INFORMATION

III. COLLEGE POLICIES

Students and faculty of Barton Community College constitute a special community engaged in the process of education. The college assumes that its students and faculty will demonstrate a code of personal honor that is based upon courtesy, integrity, common sense, and respect for others both within and outside the classroom.

The College reserves the right to suspend a student for conduct that is detrimental to the College's educational endeavors as outlined in the College Catalog.

Plagiarism on any academic endeavors at Barton Community College will not be tolerated. Learn the rules of, and avoid instances of, intentional or unintentionall plagiarism.

Anyone seeking an accommodation under provisions of the Americans with Disabilities Act should notify Student Support Services. Additional information about academic integrity can be found at the following link: http://academicintegrity.bartonccc.edu/

IV. COURSE AS VIEWED IN THE TOTAL CURRICULUM

This course is intended to provide students involved in crop production the necessary background to understand and apply the principles and practices of GPS and precision agriculture. Students will understand the basic theory behind the technologies and the basic mathematics involved. This course is required for all students in the Crop Protection Program and as an elective in Agribusiness Business Management and the A.S. in Agriculture.

V. ASSESSMENT OF STUDENT LEARNING

Barton Community College is committed to the assessment of student learning and to quality

education. Assessment activities provide a means to develop an understanding of how students learn, what they know, and what they can do with their knowledge. Results from these various activities guide Barton, as a learning college, in finding ways to improve student learning.

Course Outcomes, Competencies, and Supplemental Competencies

A. Understand the underlying principles of GPS and the technologies involved.
   1. Explain the basic principles of satellite navigation and differential correction.
   2. List the benefits of precision agriculture.
   3. Identify types of GPS satellite systems and their ownership.
   4. Describe the concept of spatial variability.
   5. Explain how GPS functions.
   6. List and compare the sources of differential correction and their advantages and disadvantages.
   7. Outline the applications of GPS in agriculture

B. Explain the concept of yield mapping and its application in crop production.
   1. Identify the components of and analyze crop yield maps.
   2. List the different combine yield monitoring systems, their components and the principles of operation.
   3. Identify the basic components common to yield monitoring systems.
   4. Accurately explain how grain flow sensors work.
   5. Analyze yield maps for variation in field results and possible causes of variation.
   6. List the possible causes of yield map variations after analysis.

C. Summarize how GPS equipment may be used to map and collect soil samples and other georeferenced data.
   1. List the types of soil sampling/mapping procedures, the advantages and disadvantages of each, and the techniques for generating soil property maps.
   2. Identify soil factors that affect crop yield.
   3. List and accurately describe accepted techniques for “filling in” missing data points and the advantages and disadvantages of each.
   4. Outline the proper procedure for collecting soil samples.

D. Explain the value of remote sensing and its application in agriculture.
   1. Describe the application of remote sensing for crop production.
   2. Define remote sensing and its application to crop production.
   3. List and accurately describe common methods used to perform remote sensing.
   4. Compare the measures of performance of remote sensing systems.
   5. List and explain possible future uses and technologies for remote sensing.

E. Use agronomic data collected and paired with exact locations to determine crop production recommendations.
   1. Describe Geographic Information Systems (GIS) and their application in crop production.
   2. Outline the basic components of GIS.

3. List and compare different GIS formats.
4. List and accurately describe common methods used to analyze precision farming data.
5. List and contrast different geographic coordinate systems in use.

F. Understand the uses, advantages, and disadvantages of the variable rate (VRT) and other emerging technologies in precision agriculture.
   1. List and compare VRT options.
   2. Identify components of various VRT technologies.
   3. Compare common sensors used with VRT and their limitations.
   4. List and accurately describe applications of VRT.
   5. Identify current VRT equipment available.
   6. Identify VRT recently adopted or in development.

VI. INSTRUCTOR'S EXPECTATIONS OF STUDENTS IN CLASS

VII. TEXTBOOKS AND OTHER REQUIRED MATERIALS

VIII. REFERENCES

IX. METHODS OF INSTRUCTION AND EVALUATION

X. ATTENDANCE REQUIREMENTS

XI. COURSE OUTLINE