COURSE SYLLABUS
Introduction to Precision Farming
3 credits
(2 hours lecture, 2 hours lab weekly)

Semester/year: **Instructor:**
Office Location: **Office Hours:**
E-Mail Address: **Office Phone:**

1. **Course Description:** This course provides an overview of precision farming concepts and the tools of precision farming (GPS, GIS and VRT). Introductory use of each of these tools in the processes of a precision farming system are covered. Hands-on activities with local data will provide an initial experience in the use of these tools. Economic and environmental benefits are also discussed.

2. **Pre-requisites:** None

3. **Required Textbooks and Supplies:** The Precision Farming Guide for Agriculturists

4. **List pre-requisite skills:** College-level English, math, and computer competency for Internet searches and report preparation.

5. **Course Objectives:** Students will be able to describe:
    - Understand the basic purposes and concepts of precision farming
    - Understand basic principles of the various tools of precision farming including GPS, GIS and VRT
    - Recognize the use of these tools to collect data, analyze data and use the information to make a decision
    - Describe justifications that demonstrate the economic or environmental benefits of precision farming

6. **Outcomes Assessment:** Mastery of the subject matter will be evaluated through written exams, quizzes, homework assignments, and computation-based laboratory exercises. A grade of 70% indicates the student generally understands the concepts presented.

7. **Policies and Procedures:**
    - Exams will be closed book and incorporate a variety of testing techniques; essay, multiple choice, true/false, matching, and fill-in-the-blank questions.
    - Quizzes will be closed book.
    - Homework assignments will be due at the start of class on the day indicated on the syllabus.
    - Cheating, dishonesty, and plagiarism will result in a penalty outlined in your college's student handbook or in the ethics statement.

8. **Grading Practices:**

Daily Assignments	100
Laboratory Exercises	100
Quiz #1 – Introduction	30
Quiz #2 – Tools of Precision Farming	30
Quiz #3- Processes of Precision Farming	30
Attendance and Participation	50
Project	50
Final Test	50
Total	**440**

Percentage	Grade
90-100%	A
80-89%	B
70-79%	C
60-69%	D
< 60%	F

9. **Library and Internet:** You will be required to do reading and conduct Internet reviews outside of class.

Topical Outline for the Course				
Week	**Classroom Lecture**	**Readings**	**Lab**	**Due**
1	Unit 1 - Introduction			
	Definition of Precision Farming	Ch1, 2-9		
	Importance of mapping in farming			
2	Geography Concepts, Scale and resolution	Ch6, 80-84		
3	Benefits and Costs of Precision Farming	Ch1, 4-5		**Test #1**
	Unit 2 - Tools of Precision Farming			
	Unit 2a GPS			
	Segments of the GPS	Ch2, 10-12		
4	How does GPS work?	Ch2, 13-16		
	Accuracy and Error	Ch2, 16-		

		17 & 25-27		
5	Differential Correction	Ch2, 18-25		
	Use of GPS - Location	Ch2, 27-28		
6	Use of GPS - Navigation	Ch2, 27-29		
7	Use of GPS - Datalogging			
8	*Unit 2b - GIS*			
	Components of GIS and ArcView Interface	Ch6, 75-79 & 89		
	Function of GIS - Display Maps			
9	Function of GIS - Store Data			
	Function of GIS - Retrieve Data			
10	Function of GIS - Analyze Data			
11	*Unit 2c - IDI*, types and uses	Ch3, 34-37:Ch7, 95		
	Examples and research	Ch5, 59, 64 & 67		**Test #2**
	Unit 3 - Processes of Precision Farming	Ch8, 112-115		
12	*Unit 3a - Data Collection*			
	Yield monitoring	Ch3, 32-34,37,40-46		
	Soil sampling	Ch4, 47-56		
	Field practice	Ch5, 58, 64-67		
	Other sources of data	Ch6, 90-91		
13	*Unit 3b - Data Analysis*			
	Raster and vector based maps	Ch6, 78-79		
	Types of analysis	Ch6, 85-89		

	Management zones			
14	*Unit 3c -Information Implementation*			
	Interpretive Maps	Ch7, 93-94&107-109		
	Graphs/Charts for decision making			
	Prescriptions for variable rate application			**Test #3**
15	Review and discuss economic studies	Ch8, 111-115		
	What are the environmental benefits			
16	Review for Final Test			**Final Test**
	Review of Test			**Final Projects**