UAS 114 UxS for Precision Agriculture

Course Master Syllabus

CATALOG DESCRIPTION: This course prepares students to enter the agriculture industry with a comprehensive understanding of best practices, technology utilization in agriculture, and the history and future of precision agriculture. Students will get an overview of precision agriculture concepts and the tools of precision agriculture (GPS and VRA/ VRT). Topics will include analyzing vegetation indices, collecting and interpreting data, creating prescription maps based on collected data and how to apply the needed pesticides, insecticides, fungicides or fertilizers utilizing VRA/ VRT, as well as current rules and regulations surrounding UAS for agriculture and utilizing unmanned systems to apply chemicals to crops.

PREREQUISITE(S):

COREQUISITE(S):

CREDITS: 3 **HOURS**: 3

REQUIRED TEXT(S):

SUPPLEMENTAL MATERIALS:

INSTRUCTOR INFORMATION:

CORE COMPETENCIES: The following core competencies are embedded in this curriculum: Communicate effectively in both speech and writing; Apply appropriate mathematical and statistical concepts and operations to interpret data to solve problems; Use scientific method of inquiry, through the acquisition of scientific knowledge; Use computer systems or other appropriate forms of technology to achieve educational and personal goals; Address an information need by locating, evaluating and effectively using information.	
LEARNING ASSESSMENT	
Student Learning Outcomes:	***Suggested Means of Assessment:***
Discuss precision agriculture and its use cases.	Reaction Paper
Analyze different technologies in precision agriculture like GPS, VRT and VRA.	Reaction Paper
Determine the use of different vegetation indices and when to utilize different ones.	Reaction Paper
Distinguish between pesticides, fungicides, insecticides and fertilizer and their various uses.	Reaction Paper
Remotely plan a mission and conduct a site survey utilizing Google maps.	Practical Exercise
Plan and execute a mission and show successful collection of needed multispectral data.	Practical Exercise
Analyze, process and know how to apply the collected data to real world solutions.	Practical Exercise
Create a prescription for the field and understand what chemicals/ treatments will need to be applied to correct any problems found within the field.	Practical Exercise & Presentation
GRADING SYSTEM:	C+ = 77 < 80
A = 90 < 100	C = 70 < 77
B+ = 87 < 90	D = 60< 70
B = 80 < 87	F = Below 60

DISABILITY SERVICES STATEMENT: Warren County Community College is committed to providing all students equal access to learning opportunities. Student Services is the campus office that works with students who have disabilities to provide and/or arrange reasonable accommodations. Students who have, or think they may have, a disability (e.g. mental health, learning, vision, hearing, physical or systemic), are invited to contact Student Services to arrange a confidential discussion at (908) 835-2300 or by email at StudentServices@warren.edu as soon as possible. Students registered for Disability Services with Student Services, who have requested accommodations for the current semester will be provided with an electronic letter

detailing individual accommodations and are encouraged to contact the instructor early in the semester to discuss accommodations outlined in their letter.

INSTRUCTIONAL SUPPORT CENTER: The Instructional Support Center (ISC), located in Room 105 across from the library, provides academic support at no cost to WCCC students and is available for courses in which they are currently enrolled. The ISC is staffed with trained professional and peer tutors who are ready to help you understand and succeed. For scheduling or further information, visit the ISC in person, online at http://www.warren.edu/tutoring/ or by telephone at (908)835-2354.

STATEMENT AND POLICY ON CHEATING, PLAGIARISM AND ACADEMIC DISHONESTY: Students are required to perform all the work specified by the instructor and are responsible for the content and integrity of all academic work submitted. A violation of academic integrity will occur if a student: (1) knowingly represents work of others as one's own, (2) uses or obtains unauthorized assistance in any academic work, (3) gives fraudulent assistance to another student, or (4) furnishes false information or other misuse of college documents.

In cases of suspected violation of academic integrity, the incident is to be reported to the Office of Academics. A student found guilty of violating the rule of academic integrity by the Vice President of Academics will be considered to have failed in personal obligation to the College; such failure will be subject to disciplinary action by the College. Unless otherwise notified, the instructor will allow students who are pending disciplinary action to attend class.

REQUIRED FORMAT FOR RESEARCH PAPERS: Research papers written for any Warren County Community College class must conform to the required documentation style. Papers written for humanities (and some social science) classes will follow the most recent edition of the Modern Language Association (MLA) in-text citation and bibliographic methods. Social science and science papers will require the use of the most recent edition of the American Psychological Association (APA) in-text citation and bibliographic methods.

Please consult with your instructor regarding the correct documentation style to use in his/her class.

ATTENDANCE POLICY: Students are expected to attend all class sessions of courses in which they are enrolled and are responsible for all material presented in class and all homework assignments.

Grades are based on the quality of work completed in meeting the requirements for a particular course, as stated in the course syllabus and catalog description.

Excessive absence may be considered sufficient cause for dismissal from class by an instructor or other appropriate college staff member. Any decision to exclude a student from class or the College due to excessive absence shall be subject to review by the President in accordance with established procedures. Students who have not attended class are not entitled to a refund of tuition.

WCCC HAYTAIAN & MAIER LIBRARY

Text: 908-652-4445 Email: lstoll@warren.edu

http://warren.libguides.com

Please see the library's website above for current semester hours.

The WCCC Library offers a wide range of services to students specific to the information literacy goals of the College which includes suggesting research strategies, facilitating the use of both digital and print resources, as well as assisting students with citations to avoid plagiarism.

The library also serves as the College's computer space, with computers for students to use when the library is open. Students also have free, unlimited printing from the College's computers, as well as space to study.

The library is where students can get their college student ID cards. All students are required to get a student ID card and carry it while on campus for security purposes. To get a student ID card, you must bring another form of ID to the library. You may also be asked to bring a printed copy of your current class schedule. You can get a student ID card any time that the library is open. These cards do not expire and can be used for your duration at WCCC.

Additionally, the library participates in a national inter-library loan program which is available free to all students and faculty. You can submit ILL requests by emailing the librarian or by stopping by the library's circulation desk.

TOPICAL OUTLINE:

1. History of precision agriculture
2. Precision agriculture uses and its difference from traditional agriculture
3. The Rise of uncrewed systems in agriculture
   a. How GPS works with uncrewed systems
   b. Utilizing VRT and VRA
   c. Licenses/ waivers needed to legally operate
4. Vegetation indices
5. Pesticides, fungicides, insecticides and fertilizer
6. Sensors and platforms for gathering data
7. Site surveys and mission planning for agriculture
8. Collecting and analyzing multispectral data
9. Executing a mission
   a. Properly collecting data
   b. Analyzing the data in post processing software
   c. Making a prescription for the field
   d. Relaying information to customer
10. Planning and executing a real spraying/ spreading mission

GRADING METHODS:

ITINERARY: