NDSU NORTH DAKOTA STATE UNIVERSITY

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PRECISION AGRICULTURE

A focused in-depth education in sciences, technologies and practices, including unmanned aerial systems (drones), remote sensing, acritical intelligence, machine learning, sensors, robotic applications, cloud computing, big data management, and site-specific resources management, awaits students in the precision agriculture (PAG) field. We prepare our graduates to apply their knowledge and skills to address profitability, production efficiency, and environmental stewardship related to modern high-tech agricultural production systems.

The Program

The PAG major in the College of Agriculture, Food Systems, and Natural Resources is administered by the Department of Agricultural and Biosystems Engineering. The PAG program leads to a Bachelor of Science degree and includes core requirements in mathematics, communications, sciences, humanities and social sciences. In the major, students will complete technical courses in machine principles, data mapping, electrical systems and electronics, crop production principles, computer applications for precision agriculture, remote sensing, data management, site-specific agriculture, and information/decision support technology. The curriculum balances instruction in agricultural sciences principles with hands-on training and application of technology. A degree is awarded after completion of a minimum of 120 credits.

The PAG major curriculum provides opportunities for individuals from both rural and urban backgrounds to choose courses to meet personal career objectives. Minors may be developed in related fields of production agriculture, agribusiness or in fields that add curriculum diversity, e.g., international studies, communication, natural resources management, business administration, accounting, or industrial management.

Internships

The curriculum requires at least one internship, but students are highly encouraged to take advantage of as many internship opportunities as they wish, especially co-operative education experiences (paid internships). These are great opportunities for students to gain hands-on experience working with precision agriculture technologies. In addition, internship experiences allow students to make more informed decisions regarding their major, to make better selection of elective courses, and open doors for employment upon graduation.

Career Opportunities

Opportunities for PAG graduates are many and diverse. Graduates may, for example, be employed by companies providing equipment and technical services related to precision agriculture, such as Titan Machinery, RDO Equipment, FarmersEdge, InteligentAg,, John Deere. The adoption of aerial remote sensing and artificial intelligence is on the rise in both private and public sectors, which creates new employment opportunities for PAG graduates. In addition, one always can start his/her own business as a private consultant on precision agriculture.

Scholarships

Several scholarships are available through the department. These scholarships range from $300 to $4,000. Students also may be eligible for scholarships from the College of Agriculture, Food Systems, and Natural Resources.

Extra-Curricular Activities

The Precision Ag Club offers students opportunities to participate in professional and social activities with other students at the local and regional levels. Being an active participant in student organizations helps students develop leadership, teamwork, organization and communication skills.

A Well-Equipped Teaching Facility

The PAG degree program is housed in the Agricultural and Biosystems Engineering building which includes offices, classrooms, and laboratories. Laboratories are equipped with state-of-the-art equipment typically used in industry and research, such as personal computers with software used to manipulate and to write prescriptions to field equipment, several models of unmanned aerial systems (drones), a variety of sensors (RGB, multispectral, and hyperspectral) mounted to drones and to benches in the lab, tractors, engines, surveying equipment, etc. Faculty expertise varies across a wide and diverse range of specialties related to agricultural and biological systems.

Precision Agriculture Plan of Study

Please note this is a sample plan of study and not an official curriculum. Actual student schedules for each semester will vary depending on start year, education goals, applicable transfer credit, and course availability. Students are encouraged to work with their academic advisor on a regular basis to review degree progress and customize an individual plan of study.

Freshman

Fall	Credits	Spring	Credits	Summer	Credits
PAG 115 Introduction to Precision Ag	2	PAG 215 Mapping of Precision Ag Data	3	PAG 115L Intro to Precision Ag Lab	1
ENGL 110 College Composition I	4	CSCI 114 Microcomputer Packages or MIS 116 Business Use of Computers	3		
COMM 110 Fundamentals of Public Speaking	3	ENGL 120 College Composition II	3		
MATH 103 College Algebra	3	MATH 105 Trigonometry	3		
Gen Ed Humanities & Fine Arts	3	PLSC 110 World Food Crops	3		
	15		**15**		**1**

Sophomore

Fall	Credits	Spring	Credits	Summer	Credits
ASM 225 Computer Applications in Agricultural Systems Management	3	PLSC 225 Principles of Crop Production	3	PAG 496 Field Experience	1
AGEC 242 Introduction to Agricultural Management	3	STAT 330 Introductory Statistics	3		
GEOG 455 Introduction to Geographic Information Systems	4	CHEM 121 General Chemistry	3		
PPTH 324 Introductory Plant Pathology	3	CHEM 121L General Chemistry I Lab	1		
Program Elective	3	PAG 496 Field Exp/Ag Technology Expo	1		
		Gen Ed Social & Behavioral Sciences	3		
	16		**14**		**1**

Junior

Fall	Credits	Spring	Credits
ASM 354 Electricity and Electronic Applications	3	PAG 315 Electronic Systems in Precision Ag	3
SOIL 210 Introduction to Soil Science	3	ASM 454 Principles and Application of Precision Agriculture	3
HNES 100 Concepts of Fitness & Wellness or HNES 111 Wellness or HNES 200 Principles of Nutrition or HNES 217 Personal and Community Health or HNES 250 Nutrition Science or ECON 205 Market Values or PH 101 Introduction to Public Health	2	GEOG 470 Remote Sensing	3
		ENGL 320 Business and Professional Writing or ENGL 321 Writing in the Technical Professions or ENGL 324 Writing in the Sciences or ENGL 459 Researching and Writing Grants and Proposal	3
Program Electives	6	Program Elective	3
	14		**15**

Senior

Fall	Credits	Spring	Credits
PAG 455 Big Data Management in Precision Ag	3	PAG 475 Precision Ag Systems	2
ASM 378 Machinery Principles and Management	3	SOIL 322 Soil Fertility and Fertilizers	3
Gen Ed Humanities & Fine Arts	3	Gen Ed Social & Behavioral Sciences	3
Program Elective	6	Program Elective	6
	15		**14**

Total Credits: 120

View NDSU equivalencies of transfer courses at: www.ndsu.edu/transfer/equivalencies

For Further Information

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