ENGINEERING: DIGITAL AGRICULTURE, MENG

for the degree of Master of Engineering in Engineering, Digital Agriculture Concentration (online)

The MEng in Engineering, Digital Agriculture Concentration is a professionally oriented degree program for students whose primary intent is a career in industry or government. This degree differs from the Master of Science degree in that it is a terminal degree and not a pathway to a doctoral program. Concentrations under the MEng in Engineering major include Aerospace Systems Engineering (http://catalog.illinois.edu/graduate/engineering/engineering-meng/aerospace-systems/), Autonomy and Robotics (http://catalog.illinois.edu/graduate/engineering/engineering-meng/autonomy-robotics/), Digital Agriculture (p. 1), Energy Systems (http://catalog.illinois.edu/graduate/engineering/engineering-meng/energy-systems/), Instrumentation and Applied Physics (http://catalog.illinois.edu/graduate/engineering/engineering-meng/instrumentation-applied-physics/), and Plasma Engineering (http://catalog.illinois.edu/graduate/engineering/engineering-meng/plasma-engineering/)..

Digital agriculture or digitization in agriculture presents a current challenge area in agriculture drawing upon practices such as Precision Agriculture, Digital farming, and advances in biotechnology and genomics, that delivers high-throughput complex data that requires processing and interpretation to become actionable.

Four main activity areas are commonly recognized:

1. Automation: Use of autonomous or semi-autonomous ground and aerial machinery and robots to perform agricultural operations.
2. Data Science in Agriculture: Extracting knowledge from complex agricultural data.
3. Spatial Agriculture:
   a. Precision agriculture: Use of high-resolution aerial imaging and ground sensors to optimize field management in real-time, with our without autonomy.
   b. Agricultural intelligence: Using long term climatic, environmental, and performance data for modeling and characterization of locations with geographic information systems.
4. Genomics, Breeding, and Biotechnology: Use of high-throughput molecular and physical analysis, such as sequencing and genotyping technologies, and image-analytics for crop improvement and management.

The common denominator for all these activity areas is collection(sensors), transmission(networks), storage & access (databases), integration & analysis (data science) of large volumes of data from various sources, including rural areas with low bandwidth for data transmission capacity. As the density of data sources and the frequency of data transmissions increase, it becomes increasingly challenging to perform these tasks without advanced computerization.

The Digital Agriculture core curriculum was tailored such that a generalist in digital agriculture would be able to operate in all of these activity areas at a level of basic competence.

Students who wish to be trained as specialists in a targeted digital agriculture activity area can choose collections of themes courses from the approved course list towards their degree completion requirements.

for the degree of Master of Engineering in Engineering, Digital Agriculture Concentration (online)

Concentration Requirements

Code	Title	Hours
Core Coursework		**16**
Choose two of the following:		
ABE 440		
ABE 425	Engrg Measurement Systems	
ABE 426	Principles of Mobile Robotics	
ABE 526	Autonomous Systems and Robots	
Choose one of the following:		
CS 411	Database Systems	
CS 437	Topics in Internet of Things	
CS 441	Applied Machine Learning	
Choose one of the following:		
CPSC 444	Introduction to Spatial Analytics	
CPSC 505	Research Methods in Crop Sciences	
Professional Development Coursework		**4**
Choose one of the following:		
ENG 573	Capstone Project	
ENG 572	Professional Practicum	
Other business and/or leadership course(s), with advisor approval		
Additional Coursework		**12**
Choose from an approved list of elective courses. Courses not on the approved list require advisor approval.		
Total Hours		**32**

Other Requirements and Conditions (may overlap)

Requirement
A minimum of 20 credit hours must be taken from the University of Illinois Urbana-Champaign campus.
A minimum of 12 credit hours of 500-level course credit is required.
No courses used to fulfill any degree requirements may be taken using the “Credit/Not Credit” option.
The minimum program GPA required for the degree is 3.0.

for the degree of Master of Engineering in Engineering, Digital Agriculture Concentration (online)

for the degree of Master of Engineering in Engineering, Digital Agriculture Concentration (online)

Admission Requirements

The University of Illinois Urbana-Champaign policy requires applicants to hold at least a 3.0/4.0 or higher GPA in the last two years of their undergraduate study to be eligible for graduate studies. Applicants are not required to provide GRE scores; however, as per UIUC Graduate College Requirements, all applicants whose native language is not

English are required to submit the TOEFL or IELTS results as evidence of English proficiency.

TOEFL or IELTS scores must be less than two years old from the first day of class at the proposed term of entry to be valid.

Applicants should hold a 4-year bachelor's degree (or equivalent). Applicants whose undergraduate degree is a three-year program may not be eligible for graduate-level admissions consideration at the University of Illinois. Eligibility depends on the country where the applicant received their degree -- please see the Graduate College's list of eligible degrees. The recommended undergraduate GPA for applicants applying is a 3.2/4.0 for the last two years of undergraduate study.

Applications for this Program do not require letters of recommendation. However, they will be considered if included, especially if used to justify experience in place of required coursework or other irregularities.

To succeed in graduate-level C.S. courses required for this Program, candidates must have prerequisite coursework or commensurate experience in object-oriented programming, data structures, algorithms, linear algebra, and statistics/probability. Applicants interested in pursuing automation and data science-related themes in this Program are strongly encouraged to complete courses in these areas at a local university, or via iCAN program, or as non-degree online courses from Campus Graduate Certificate Programs before enrolling to this Program. Applicants who can not present transcripted grades for the courses mentioned above would be required to pass the Data Structures Proficiency exam to be eligible for admission.

Financial Aid
Students in concentrations under the MEng in Engineering major are not eligible for Board of Trustees (BOT) tuition-waiver generating assistantships at the University of Illinois.

Data Structures Proficiency Exam Details
• The exam is hosted on PrairieLearn (a University of Illinois online assessment platform) and is proctored by ProctorU (an online third-party proctoring service).
• The exam is 3 hours long.
• A grade of B+ on the exam (in addition to a minimum 3.0/4.0 GPA in the last two years of the
undergraduate degree) is required for the application to be considered in the admission process.
• A minimum of 30 calendar days' learning period is required between any two consecutive exam
attempts.

for the degree of Master of Engineering in Engineering, Digital Agriculture Concentration (online)

Department Head: Ronaldo G Maghirang
Director of Graduate Studies: Maria Chu

Overview of ABE Admissions & Requirements (https://abe.illinois.edu/apply/#graduate)
Graduate College Admissions & Requirements (https://grad.illinois.edu/admissions/apply/)

Digital Ag Program website (https://digitalag.illinois.edu/meng/)
Department website (https://abe.illinois.edu/)

Grainger College of Engineering website (https://grainger.illinois.edu/)

ACES website (https://aces.illinois.edu/)

Program Contact: Christina Tucker (email) (lyvers2@illinois.edu)
Department Address: AESB 360A, 1304 W. Pennsylvania Ave. Urbana, IL 61801