# AGRICULTURAL & BIOLOGICAL ENGINEERING, MS

*for the degree of Master of Science in Agricultural & Biological Engineering*

Opportunity exists for specializing in computational science and engineering via the Computational Science & Engineering (http://catalog.illinois.edu/graduate/engineering/concentration/computational-science-engineering/) optional graduate concentration.

## Admission Requirements

Admission requirements include completion of an undergraduate program equivalent to the Agricultural and Biological Engineering (ABE) curriculum with at least a 3.0 grade point average (A = 4.0) for the last two years of undergraduate course work. Applicants must submit Graduate Record Examination (GRE) scores.

All applicants whose native language is not English must submit a minimum TOEFL (http://www.toefl.org/) score of 88 (iBT), 230 (CBT) or 570 (PBT); or minimum International English Language Testing System (IELTS) (http://www.ielts.org/) academic exam scores of 6.5 overall. Applicants may be exempt from the TOEFL if certain criteria (http://grad.illinois.edu/admissions/instructions/04c/) are met. For those taking the TOEFL or IELTS, full admission status (http://grad.illinois.edu/admissions/instructions/04c/) is granted for scores greater than 102 (TOEFL iBT), 253 (TOEFL CBT), 610 (TOEFL PBT), or 7.0 (IELTS). Limited status (http://grad.illinois.edu/admissions/instructions/04c/) is granted for lesser scores and requires enrollment in English as a Second Language (ESL) courses based on an ESL Placement Test (EPT) taken upon arrival to campus.

## Financial Aid

Fellowships, supported by University, College of Agricultural, Consumer and Environmental Sciences, and College of Engineering funds, are available on a competitive basis. A limited number of assistantships, providing both teaching and research experience, are often available on a half-time basis.

All applicants, regardless of US citizenship, whose native language is not English and who wish to be considered for teaching assistantships must demonstrate spoken English language proficiency (http://grad.illinois.edu/admissions/taengprof.htm) by achieving a minimum score of 24 on the speaking subsection of the TOEFL iBT or 8 on the speaking subsection of the IELTS. For students who are unable to take the iBT or IELTS, a minimum score of 4CP is required on the EPI test (http://cte.illinois.edu/testing/oral_eng/epi_overview.html), offered on campus. All new teaching assistants are required to participate in the Graduate Academy for College Teaching (https://citl.illinois.edu/citl-101/teaching-learning/grad-academy-for-college-teaching/) conducted prior to the start of the semester.

## Department Research

Current research interests of the faculty include off-road equipment engineering (robotics and machinery automation, remote sensing and precision agriculture, machinery management systems, pesticide application technology, engines and biofuels); soil and water resources (hydrology, erosion and sediment transport, water management, wetlands, and water quality); bioenvironmental engineering (building environment and energy conservation, air quality, renewable energy, biomass to bioenergy conversion, structural analysis and facility design, building materials evaluation, environmental control and ergonomic design for plant, animal, and human housing systems and facilities); food and bioprocess engineering (engineering properties of foods, physical properties of biological products, grain drying, grain quality evaluation, dry-grind corn processing, wet and dry milling, modified bioprocesses for improved co-products, fuel and chemicals, fermentation, and transport phenomenon in biological materials); or electronic and electrical systems (biosensors and controls, energy systems, machine vision, near-infrared spectroscopy applications, bionanotechnology, microfabricated devices, bioconjugation techniques, transcriptional control, modeling life support systems, and multiscale biological processes). For more details, visit the department's research website. (https://abe.illinois.edu/research/areas/)

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For additional details and requirements refer to the department's Graduate Handbook (https://abe.illinois.edu/academics/graduate-degrees/) and the Graduate College Handbook (http://grad.illinois.edu/gradhandbook/).

### Thesis Option

| Code | Title | Hours |
|---|---|---|
| ABE 599 | Thesis Research | 8 |
| ABE 594 | (Registration of 0 hours required every term while in residence) | 0 |
| ABE 501 | Graduate Seminar: Foundations of Success | 1 |
| One MATH course beyond differential equations from an approved list (http://abe.illinois.edu/graduate-students/abe-graduate-student-course-requirements/) | | 3-4 |
| One course in statistical design and analysis from an approved list (http://abe.illinois.edu/graduate-students/abe-graduate-student-course-requirements/) | | 3-5 |
| One course in instrumentation and measurement from an approved list (http://abe.illinois.edu/graduate-students/abe-graduate-student-course-requirements/) | | 3-5 |
| One 500-level course (taken for at least 3 credit hours) in an area of specialization – chosen in consultation with advisor | | 3-5 |
| Elective courses – chosen in consultation with advisor (subject to Other Requirements and Conditions below) | | 4-11 |
| **Total Hours** | | **32** |

### Other Requirements and Conditions

| Requirement | Description |
|---|---|
| Other Requirements and Conditions may overlap | |
| | A maximum of 4 hours of ABE 597 (or other independent study) may be applied toward the elective course work requirement. |
| | A minimum of 12 500-level credit hours applied toward the degree. |
| Minimum GPA | 3.0 |

### Non-Thesis Option

| Code | Title | Hours |
|---|---|---|
| ABE 594 | (Registration of 0 hours required for every term while in residence) | 0 |
| One MATH course beyond differential equations from an approved list (http://abe.illinois.edu/graduate-students/abe-graduate-student-course-requirements/) | | 3-4 |
| One course in statistical design and analysis from an approved list (http://abe.illinois.edu/graduate-students/abe-graduate-student-course-requirements/) | | 3-5 |
| One course in instrumentation and measurement from an approved list (3-5 hours) (http://abe.illinois.edu/graduate-students/abe-graduate-student-course-requirements/) | | 3-5 |
| One 500-level course (taken for at least 3 credit hours) in an area of specialization – chosen in consultation with advisor | | 3-5 |
| Elective courses – chosen in consultation with advisor (subject to Other Requirements and Conditions below) | | 15-24 |
| **Total Hours** | | **36** |

### Other Requirements and Conditions

| Requirement | Description |
|---|---|
| Other Requirements and Conditions may overlap | |
| | A maximum of 4 hours of ABE 597 (or other independent study) may be applied toward the elective course work requirement. |
| | A minimum of 12 500-level credit hours applied toward the degree. |
| | The non-thesis option is only allowed with departmental approval at or before initiation of graduate study, and a final report is required. |
| Minimum GPA: | 3.0 |

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Student learning outcomes are based on educational outcomes suggested by the Accreditation Board for Engineering and Technology (ABET) and the objectives of the program:

1. An ability to apply knowledge of mathematics, science, and engineering;
2. An ability to design and conduct experiments, as well as to analyze and interpret data;
3. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
4. An ability to function in multidisciplinary teams;
5. An ability to identify, formulate, and solve engineering problems;
6. An understanding of professional and ethical responsibility;
7. An ability to communicate effectively;
8. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
9. A recognition of the need for and an ability to engage in life-long learning;
10. A knowledge of contemporary issues;
11. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice;
12. Conduct independent research with expertise in research design, methods, and analysis;
13. Function effectively in leadership roles in their professional careers and activities in professional societies.

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## Department of Agricultural & Biological Engineering

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## College of Agricultural, Consumer & Environmental Sciences (ACES)

College of Agricultural, Consumer & Environmental Sciences website (http://catalog.illinois.edu/schools/aces/)

## Grainger College of Engineering

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

## Admissions

Agricultural & Biological Engineering Admissions & Requirements (https://abe.illinois.edu/apply/#graduate)
Graduate College Admissions & Requirements (https://grad.illinois.edu/admissions/apply/)