BIOLOGICAL ENGINEERING (PHD)

The Department of Biological Systems Engineering offers a Ph.D. in biological engineering with specialization options in water resources planning and management, water resources engineering, and environmental studies.

Description

Graduate study may be directed toward agricultural power and machinery systems, animal waste management, animal well-being, biomedical engineering, bioprocessing, computer applications, control systems, decision support systems, environmental engineering, food process engineering, geographic information systems, global positioning systems, ground and surface water management, irrigation system design, materials handling and processing systems, monitoring and controlling biological systems, plant environment, risk assessment, soil and water conservation, solid and hazardous waste management, water quality, and other areas of engineering science and design.

Students have access to state-of-the-art research facilities and equipment. These facilities include 15 laboratories in L. W. Chase Hall, Splinter Laboratories Building, and IAPC Pilot Plant. Field research sites in Nebraska include the Rogers Memorial Farm and Agricultural Research and Development Center in Lincoln; Haskell Agricultural Laboratory near Concord, Nebraska; and Research and Extension Centers at North Platte and Scottsbluff, Nebraska. Together these facilities capture the wide range of climate, soil, and cropping systems that exist in the state.

Specializations

- Animal Health, Welfare, and Precision Management
- Ecological Engineering
- Environmental Studies
- Irrigation and Agricultural Water Management
- Water Resources Planning and Management

Program-Related Information

Graduate Chair

Aaron Mittelstet
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Support Staff

Abigail Zagotta
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Program Website

https://engineering.unl.edu/bse/graduate-programs/

Applying for Admission

Standard requirements for all graduate programs

- Application for Admission with $50 non-refundable application fee (https://graduate.unl.edu/admissions/requirements/#appfee).
- Transcripts (https://graduate.unl.edu/admissions/requirements/#transcripts) (unofficial): Uploaded as part of application form.

  If International: Uploads must include all college- or university-level transcripts or mark sheets (records of courses and marks earned), with certificates, diplomas, and degrees plus certified English translations.

  After admission: Official documents are required from all students who are admitted and enroll. Photocopies of certified records are not acceptable. International students enrolled in other U.S. institutions may have certified copies of all foreign records sent directly to the Office of Graduate Studies by their current school's registrar office.
- If applicant's native language is not English, verification of English proficiency (https://graduate.unl.edu/admissions/english-proficiency/) is required.

  When sending TOEFL scores, our institution code is 6877 and a department code is not needed.
- If applicant is not a US citizen and expects an F or J visa: financial information (https://graduate.unl.edu/prospective/international/financial/).
- Applicants must also fulfill any additional requirements the department specifies at the time of application.

Additional requirements specific to this program

- Minimum English proficiency: Internet TOEFL 80, IELTS 6.5
- GRE (optional)
- Resume/CV
- Personal Statement: Include a description of your 1) motivation and goals for pursuing a graduate degree; 2) relevant research and communication skills; 3) persistence or ability to overcome obstacles; and 4) examples of leadership and outreach. Also list any specific faculty members you are interested in working with.
- Three letters of recommendation
- Academic eligibility: Applicants should have completed a Bachelor of Science (BS) degree in an engineering field. Applicants who have not completed a BS degree in an engineering field will be required to take undergraduate science, math, and engineering courses as selected by the BSE Graduate Committee.
- Faculty: Applicants must be accepted by a faculty advisor to be admitted.

Admission Application Deadlines

For full financial consideration, students must apply by January 15 for Fall and Summer, September 1 for Spring.

Requirements

Hours required: 90

Irrigation and Agricultural Water Management

AGEN 854	Irrigation Laboratory and Field Course	3
AGEN 953	Advanced Irrigation and Drainage Systems Engineering	3
Choose one of the following:		
AGEN 841	Animal Waste Management	3
AGEN 954	Watershed Modeling	3
BSEN 855	Nonpoint Source Pollution Control Engineering	3
BSEN 879	Hydroclimatology	3

Water Resources Planning and Management

An intra-university masters-level minor/specialization with emphasis on water resources planning and management. Each student will be required to complete:

1. A major in one of the departments with approval to offer the option as a minor or specialization
2. Nine hours of water resources-related courses* from departments outside the student's major field (6 hours of which must be from those courses marked with a "+") and approved by the Water Resources Advisory Committee.

The master's degree will be granted in one of the disciplines. The student must be formally registered in one of the departments with approval to offer the option as a minor or specialization. The recommended master's degree option is I (thesis) but other options may be approved. The minor or specialization can be noted on the student's final transcript, for example, civil engineering (water resources planning and management).

Departments/Program(s) with Approval to Offer Option as a Minor or Specialization:

- Agricultural Economics
- Agronomy/Horticulture
- Animal Science
- Biological Sciences
- Biological Systems Engineering
- Civil and Environmental Engineering
- Community and Regional Planning
- Economics
- Earth and Atmospheric Sciences
- Industrial and Management Systems Engineering
- Political Science
- School of Natural Resources
- Sociology.

A Water Resources Advisory Committee coordinates the interdisciplinary aspects of the minor/specialization. The Director of the Nebraska Water Center in the Robert B. Daugherty Water for Food Global Institute serves as chair with one member from each participating department. Approval of individual student programs of study, degree option, and thesis topics (if applicable) will have the concurrence of the student's major department and the chair of the advisory committee. One member of the student's examining committee will be appointed from the Water Resources Advisory Committee. This member cannot be from the student's major department.

Water Resources Planning and Management Advisory Committee:

- Professors Ray (chair)
- Thomas Franti (co-chair)
- Matthew Cushing, Department of Economics
- Mark Lagrimini, Department of Agronomy and Horticulture
- Sheila Purdum, Animal Sciences
- Thomas Franti, Department of Biological Systems Engineering
- David Admiraal, Department of Civil and Environmental Engineering
- Dona-Gene Barton, Department of Political Science
- Deb Brown, School of Biological Sciences
- Kim Tyler or Julia McQuillan, Department of Sociology
- Karina Schoengold, Department of Agricultural Economics
- Steven Thomas, School of Natural Resources
- Zhenghong Tang, Community, and Regional Planning Program