

# BIOENGINEERING, PHD

for the degree of Doctor of Philosophy in Bioengineering

The Department of Bioengineering offers both a traditional doctoral program (for students with a previous master's degree) and a direct doctoral program (for students with only a bachelor's degree). Students in both programs are required to have a research advisor and applicants are encouraged to contact department faculty (<https://bioengineering.illinois.edu/directory/>) in their areas of interest to inquire about possible research opportunities.

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

## Department Research

Bioengineering faculty perform research in the areas of Bioimaging at Multi-Scale; Bio-Micro and Nanotechnology; Synthetic Bioengineering; Molecular, Cellular, and Tissue Engineering; Computational and Systems Biology; Research in BME Education. In addition to Bioengineering faculty, the Department of Bioengineering has more than 50 affiliate faculty (<http://bioengineering.illinois.edu/directory/>).

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For additional details and requirements for all degrees, please refer to the department's Graduate Studies Web site (<http://bioengineering.illinois.edu/>) and the Graduate College Handbook (<http://grad.illinois.edu/gradhandbook/>).

## Entering with approved M.S. degree

Code	Title	Hours
BIOE 599	Thesis Research (min-max applied toward degree)	52
Elective courses		12
<b>Total Hours</b>		<b>64</b>

## Other Requirements and Conditions

Requirement	Description
Other Requirements and Conditions may overlap	
Minimum program GPA:	3.0
A Masters degree is required for admission to the Ph.D. program.	
Qualifying exam	
Preliminary exam	
Final exam and dissertation defense	
Dissertation deposit	

## Entering with B.S. degree

Code	Title	Hours
BIOE 599	Thesis Research (min-max applied toward degree)	55
500-level BioE courses: See approved list		21
Elective courses: At least 12 hours must be engineering graduate-level courses. See website for more details.		20
<b>Total hours</b>		<b>96</b>

## Other Requirements and Conditions

Requirement	Description
Other Requirements and Conditions may overlap	
Minimum program GPA:	3.0
Qualifying exam	
Preliminary exam	
Final exam and dissertation defense	
Dissertation deposit	

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1. Ability to apply **quantitative** skills and **engineering principles** to propose novel and practical solutions to medical/human health problems
2. Understanding of **professional** and **ethical** responsibilities
3. Ability to **communicate** scientific problems and solutions, as well as their impact, effectively to a diverse audience and stakeholders, both orally and in writing
4. Demonstrate moderate **technical** mastery in chosen research area, shown by the ability to identify an important scientific problem, formulate a hypothesis, and design experiments to conduct research and data analysis to test the hypothesis. The student should also be able to formulate alternatives.
5. Develop effective **leadership** skills in order to foster the ability to conduct **collaborative** research and work with a diverse team

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## Admission Requirements

Applicants should have an undergraduate or graduate degree in a natural science, computer science, or engineering. A minimum grade point average of 3.00 (A = 4.00) for the last two years of undergraduate study is required. Applicants should show evidence of strong quantitative skills and of serious interest in the life sciences. All applicants must submit results from the Graduate Record Examination (GRE) (<http://www.ets.org/>) general test. The GRE exam score requirement may be waived at the department's discretion.

All applicants whose native language is not English are required to submit TOEFL (<http://www.toefl.org/>) or O (<http://www.ielts.org/>) AEI (<https://linguistics.illinois.edu/testing/oeai/>) scores as evidence of English proficiency. Minimum admission requirements (<https://grad.illinois.edu/admissions/instructions/04c/>) are set by the Graduate College.

## Financial Aid

Qualified students may apply for financial aid in the form of fellowships, teaching and research assistantships, and waivers of tuition and

service fees. Starting in Fall 2020, Grainger Engineering PhD students in their first five years of enrollment who meet the minimum eligibility requirements (<https://grainger.illinois.edu/academics/graduate/phd-funding-guarantee/>) are guaranteed a funded appointment for fall and spring that includes a full tuition waiver, a partial fee waiver, and a stipend.

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 OEAI. For students who are unable to take the iBT or OEAI, a minimum score of 4CP is required on the OEAI test (<https://linguistics.illinois.edu/testing/oeai/>), offered on campus. All new teaching assistants are required to participate in the Graduate Academy for College Teaching ([http://cte.illinois.edu/programs/ta\\_train.html](http://cte.illinois.edu/programs/ta_train.html)) conducted prior to the start of the semester.

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## Graduate Programs in Bioengineering

- Majors
  - Bioengineering, MEng (<http://catalog.illinois.edu/graduate/engineering/bioengineering-meng/>)
    - concentrations
      - Bioinstrumentation (<http://catalog.illinois.edu/graduate/engineering/bioengineering-meng/bioinstrumentation/>)
      - General Bioengineering (<http://catalog.illinois.edu/graduate/engineering/bioengineering-meng/general-bioengineering/>)
    - Bioengineering, MS (<http://catalog.illinois.edu/graduate/engineering/bioengineering-ms/>)
    - Bioengineering, PhD (p. 1)
      - optional concentrations
        - Computational Science and Engineering (<http://catalog.illinois.edu/graduate/engineering/concentration/computational-science-engineering/>)
        - Data Science and Engineering (<https://cse.illinois.edu/cse-educational-programs/dse-graduate-concentration/>)
    - Biomedical Image Computing, MS (<http://catalog.illinois.edu/graduate/engineering/biomedical-image-computing-ms/>)
- Concentrations
  - Bioinstrumentation (<http://catalog.illinois.edu/graduate/engineering/bioengineering-meng/bioinstrumentation/>)
    - available for
      - Bioengineering, MEng (<http://catalog.illinois.edu/graduate/engineering/bioengineering-meng/>)

The Department of Bioengineering offers studies leading to the Master of Engineering in Bioengineering (MEng), the Master of Science in Bioengineering (MS), the Master of Science in Biomedical Image Computing (MS in BIC), and the Doctor of Philosophy (PhD) in Bioengineering. The Bioengineering Graduate Program provides students with educational and research experiences that integrate the sciences of biology and medicine with the practices and principles of engineering. For the MS and PhD programs, areas of focus include Bio-

imaging, Cell & Tissue Engineering, Micro and Molecular Technologies, and Computational Biology.

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## Department of Bioengineering

Department Head: Mark Anastasio ([maa@illinois.edu](mailto:maa@illinois.edu))

Director of Graduate Studies: Wawrzyniec Dobrucki

([dobrucki@illinois.edu](mailto:dobrucki@illinois.edu))

Bioengineering website (<https://bioengineering.illinois.edu/>)

Program website (<https://bioengineering.illinois.edu/admissions/graduate/programs/phd/>)

1240 Everitt Laboratory, 1406 W Green St, Urbana, IL 61801

(217) 300-8066

Bioengineering email (<http://catalog.illinois.edu/graduate/engineering/bioengineering-phd/bioe-gradprograms@illinois.edu>)

## Grainger College of Engineering

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

## Admissions

Graduate Contact: Sarah Layne (<http://catalog.illinois.edu/graduate/engineering/bioengineering-phd/slayne2@illinois.edu>)

Department Admissions & Requirements (<https://bioemeng.illinois.edu/admissions/>) (<https://bioengineering.illinois.edu/admissions/graduate/>)  
 Graduate College Admissions & Requirements (<https://grad.illinois.edu/admissions/apply/>)