ENGINEERING: INSTRUMENTATION AND APPLIED PHYSICS, MENG

for the degree of Master of Engineering in Engineering, Instrumentation and Applied Physics concentration

Now accepting applications

The Grainger College of Engineering offers a Master of Engineering (MEng) degree program for students whose primary intent is a professional career in industry or government. This degree differs from the Master of Science (MS) degree in that it is a professionally oriented master's degree that is not a pathway to a doctoral program. The Major in Engineering for the M.Eng. degree requires the selection of an interdisciplinary concentration, which must be identified at the time of application. Available concentrations are: 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 (http://catalog.illinois.edu/graduate/engineering/engineering-meng/digital-agriculture/), 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/).

The M.Eng. in Instrumentation and Applied Physics is a residential program that spans the fall and spring semesters of a single academic year. The M.Eng. in Instrumentation and Applied Physics is strongly project-focused and comprises 16 credit hours of required core courses (including a two-semester on-campus project), 12 credit hours of elective technical courses, and 4 credit hours of professional development courses.

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For additional details and requirements, please refer to the webpage of the concentration's home unit and the Graduate College Handbook (http://grad.illinois.edu/gradhandbook/).

Code	Title	Hours
PHYS 523	Instrumentation and Applied Physics Project (4 credit hours in two consecutive semesters)	8
PHYS 524	Survey of Instrumentation and Laboratory Techniques	2
PHYS 525	Survey of Fundamental Device Physics	2
PHYS 503	Instrumentation Physics Applications of Machine Learning	4
Elective coursework (with approval of advisor) from relevant interdisciplinary areas, such as:		12
Material science; Condensed matter physics, including semiconductor physics; Quantum mechanics and quantum information; Statistical and thermal physics; Electrodynamics and electromagnetic radiation; Atomic, molecular, and optical physics; Mathematical physics; Nuclear, plasma, and radiological physics; Biophysics and bioengineering.		
Professional Development coursework (from approved list):		4
TE 450	Startups: Incorporation, Funding, Contracts, & Intellectual Property	
TE 460	Lectures in Engineering Entrepreneurship	
TE 461	Technology Entrepreneurship	
TE 466	High-Tech Venture Marketing	
TE 565	Technol Innovation & Strategy	
TE 566	Finance for Engineering Mgmt	
other course in Business, Law, or Economics		
Total Hours		**32**

Other requirements

Requirement	Description
No courses used to fulfill any degree requirement may be taken using the "Credit/No Credit" option.	
Minimum GPA: 3.0	

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Instrumentation and Applied Physics M.Eng. graduates will:

1. Be able to conceive, propose, plan, and execute technical projects using a wide range of laboratory tools, instrumentation, and analysis techniques;
2. Understand the physical principles and mathematical foundations governing the behavior of some of the devices, tools, and techniques that might be relevant to execution of technical projects;
3. Develop an ability to work collaboratively with a diverse team;
4. Be able to propose an efficient (tool-dependent) sequencing of activities in a technical project, using standard project management tools;
5. Learn to consider the tradeoffs—balancing advantages and disadvantages—associated with technology downselects;
6. Be able to analyze measurement data and draw supportable conclusions, including the use of deep learning and machine learning techniques in the analysis of complex data sets drawn from fields that include physics, medicine, and agriculture;
7. Develop an ability to communicate—both orally and in writing—to present technical topics effectively to specialists and non-specialists; and
8. Develop an understanding of basic business principles and practices.

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Admission

Students with bachelor's or master's degrees in physics, astronomy, or related fields will be considered for admission for the fall term if they have a grade point average of at least 3.00 (A = 4.00) for the last two years of undergraduate study. Many students who have minored in physics will also be qualified for enrollment.

Before enrollment, students should have completed intermediate undergraduate level courses in classical mechanics (comparable to UIUC's Physics 325), electrodynamics (comparable to Physics 435), and quantum mechanics (comparable to Physics 485 or 486). A course in statistical and thermal physics (similar to Physics 427) is recommended, but not required. We also require students to have taken a course in multivariable calculus at a level appropriate for the intermediate physics courses mentioned above. Applicants for admission should already be familiar with at least one modern high-level programming language like Python, C++, or Java.

All applicants whose native language is not English are required to submit TOEFL (http://www.toefl.org/) or International English Language Testing System (IELTS) (http://www.ielts.org/) scores as evidence of English proficiency requirements for full admission status. Minimum admission requirements (https://grad.illinois.edu/admissions/instructions/04c/) are set by the Graduate College.

Prospective students are not required to have take the Graduate Record Exam (GRE).

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 Urbana-Champaign. Students are encouraged to seek external funding for which they may be eligible, and refer to their program of interest's website to learn about potential funding resources.

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Program Director: Matthias Grosse Perdekamp (mgp@illinois.edu)
Instrumentation and Applied Physics Program website (https://physics.illinois.edu/academics/masters/)

Physics

Department Head: Matthias Grosse Perdekamp (mgp@illinois.edu)
Director of Graduate Studies: Lance Cooper (slcooper@illinois.edu)
Physics Department website (https://physics.illinois.edu)
227 Loomis Lab, 1110 W Green St, Urbana, IL 61801
(217) 333-3645
Physics Graduate Office email: grad@physics.illinois.edu (grad@physics.illinois.edu)
Physics Department Faculty (https://physics.illinois.edu/people/directory/)

Grainger College of Engineering

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

Admissions

Grainger Graduate Admissions & Requirements (https://grainger.illinois.edu/academics/graduate/)
Graduate College Admissions & Requirements (https://grad.illinois.edu/admissions/apply/)