APPROVED BY SENATE
10/18/2021

EP.22.013_FINAL
Approved by EP 10/04/2021

: ENGINEERING: INSTRUMENTATION AND APPLIED PHYSICS, MENG

In Workflow

1. U Program Review (dforgacs@illinois.edu; eastuby@illinois.edu; aledward@illinois.edu)
2. 1244 Head (ychemla@illinois.edu; mgp@illinois.edu; slcooper@illinois.edu)
3. KP Committee Chair (bsnewell@illinois.edu; kcp@illinois.edu; jmakela@illinois.edu; amccul2@illinois.edu; bodony@illinois.edu)
4. KP Dean (candyd@illinois.edu)
5. University Librarian (jpwilkin@illinois.edu)
6. Grad_College (agrindly@illinois.edu; lowry@illinois.edu)
7. Provost (kmartens@illinois.edu)
8. Senate EPC (bjlehman@illinois.edu; moorhouz@illinois.edu; kmartens@illinois.edu)
9. Senate (jtempel@illinois.edu)
10. U Senate Conf (none)
11. Board of Trustees (none)
12. IBHE (none)
13. DMI (eastuby@illinois.edu; aledward@illinois.edu; dforgacs@illinois.edu)

Approval Path

1. Mon, 17 Feb 2020 19:58:37 GMT
   Deb Forgacs (dforgacs): Approved for U Program Review
2. Fri, 06 Mar 2020 05:49:03 GMT
   Matthias Perdekamp (mgp): Approved for 1244 Head
3. Tue, 13 Oct 2020 18:10:23 GMT
   Keri Pipkins (kcp): Rollback to 1244 Head for KP Committee Chair
4. Tue, 13 Apr 2021 22:51:45 GMT
   S. Lance Cooper (slcooper): Approved for 1244 Head
5. Wed, 05 May 2021 22:06:35 GMT
   Keri Pipkins (kcp): Approved for KP Committee Chair
6. Thu, 06 May 2021 02:54:23 GMT
   Candy Deaville (candyd): Approved for KP Dean
7. Thu, 06 May 2021 02:58:46 GMT
   John Wilkin (jpwilkin): Approved for University Librarian
8. Wed, 08 Sep 2021 20:12:53 GMT
   Allison McKinney (agrindly): Approved for Grad_College
9. Mon, 13 Sep 2021 19:20:24 GMT
   Kathy Martensen (kmartens): Approved for Provost

New Proposal

Date Submitted:Fri, 14 Feb 2020 22:42:55 GMT

Viewing:: Engineering: Instrumentation and Applied Physics, MEng

Changes proposed by: Harry Dankowicz

Proposal Type

Proposal Type:

Concentration (ex. Dietetics)

Administration Details

Official Program Name

Engineering: Instrumentation and Applied Physics, MEng

Sponsor College

Grainger College of Engineering

Sponsor Department

Physics

Sponsor Name

Matthias Grosse Perdekamp

Sponsor Email

mgp@illinois.edu

College Contact

Harry Dankowicz

College Contact Email

danko@illinois.edu

Does this program have inter-departmental administration?

No

Proposal Title

Effective Catalog Term

Fall 2021

Provide a brief, concise description (not justification) of your proposal.

Establish a Graduate Concentration in Instrumentation and Applied Physics within the Master of Engineering in Engineering Degree

Program Justification

Provide a*brief*justification of the program, including highlights of the program objectives, and the careers, occupations, or further educational opportunities for which the program will prepare graduates, when appropriate.

Brief description:

The proposed Concentration in Instrumentation and Applied Physics is a fast-paced, one-year, professionally-oriented curriculum that aims to provide students with solid foundational and practical experience in the planning and execution of technical projects using a wide range of laboratory tools, instrumentation, and analysis techniques. Students will learn to conceive, propose, plan, perform, analyze, and report conclusions using such tools. They will become familiar with the underlying principles of key physical measurement techniques. They will develop competence and integrate interdisciplinary knowledge, spanning electrical and mechanical engineering, materials science, mathematics, coding, embedded systems design, 3D printing, and CAD/CAM.

The proposed program will be heavily project based, with 8 credit hours of in-residence laboratory work framed as the complete execution—from proposal through design and construction, execution, analysis, and presentation—of a collaborative technical project. The program's coursework requirements further include 8 credit hours of instrumentation, device physics, and machine learning/artificial intelligence courses, as well as 12 elective credit hours chosen from relevant interdisciplinary areas, e.g., biophysics, nuclear instrumentation, and material science. An additional 4 credit hours of professional development coursework provide a complementary focus on skills relevant for industry careers.

Justification:

As part of their doctoral research, students in the Grainger Engineering PhD program in Physics typically develop into instrument makers in service of their scientific goals, since it is often true that commercial solutions do not yet exist. Conversations with representatives from prominent organizations, such as Sandia National Laboratory and Meyer Sound, suggest that the ability to plan, execute, and report results from technical projects that involve advanced measurement, instrumentation, and analysis techniques are valued by prospective employers. The goal of the proposed Concentration in Instrumentation and Applied Physics is to teach these skills intentionally to professionally-oriented master's students, rather than incidentally during the course of scientific research that would lead to a PhD. This will allow students intent on industry careers to develop highly marketable skills as part of a deliberate curriculum.

Many professional master's programs rely on capstone projects performed off campus during brief internships under the supervision of an industry affiliate to provide a modicum of practical experience. Our program will take a different approach, featuring an on-campus project course that includes extensive laboratory time over two semesters. Students will work in closely supervised small collaborations of two to four people, defining a measurement to be performed, designing and building an instrument that might be capable of recording data necessary for the measurement, testing their device, doing the field work to record valid data, then analyzing the data to form supportable, reproducible conclusions. Along the way they will report on their progress, both through informal presentations to the class and more formal written reports, including a substantial paper at the end of the second semester. The range of topics suitable for project work is exceptionally broad, encompassing such diverse fields as agriculture, rail and automotive transport, acoustics, music, medicine, energy and the environment, public safety, and law enforcement. The project focus and breadth of technical challenges presented to students will distinguish this concentration from the more narrow (and more strongly coursework-focused) programs offered at other universities.

To gauge the demand for the proposed program, market research was performed through a combination of web searches and surveys of faculty administrators and undergraduate students in physics departments across the nation. It was determined that 142 physics departments (from among 760 physics bachelor's-granting institutions) offer terminal master's programs, awarding 717 degrees in 2017. Most programs are residential, with an average time-to-completion of 18.8 months. Survey replies from department heads/chairs and directors of undergraduate studies at 257 institutions suggested that 15% of their students were expected to enroll in terminal master's programs, while 45% typically move directly into the workforce. Replies from 668 physics majors at 107 institutions similarly indicated that 35% were very likely to apply to a terminal master's program. These survey responses favored the hands-on collaborative project work design of the proposed curriculum and the relatively short program duration, with some 23% being very likely to consider enrolling in the proposed concentration. Our investigations suggest that the market for professional master's degrees in physics is not saturated, and that our proposed program—when marketed intelligently and vigorously—will compete successfully for students. The broadly configurable focus, to be defined by each student in collaboration with the program advisor, should facilitate successful entry of our graduates into the workforce.

Perhaps the best market indicators are the employability and high starting salaries of recent Grainger Engineering Physics BS graduates. Data from the Illinois Success portal shows that 87% are in the workforce, with an average reported income of $69,064. Recent data from the American Institute of Physics indicates that the median starting salary for terminal master's recipients is about $10,000 higher than for bachelor's-only graduates. In conversations with industry representatives, as well as the Physics Department's advisory board, we regularly hear comments about the effectiveness of physics graduates in commercial settings, and how they often move into leadership positions sooner than is the case for new employees with narrower training in one of the engineering disciplines. And the directors of physics master's programs at other schools tell us that even their weaker students are snapped up by employers, who report back on how impressed they are with the program's graduates.

In late 2019 we distributed a survey to our industry contacts asking about the skills they wanted to see in prospective employees. We wrote to 65 companies that had sent representatives to the GCOE job fair earlier in the fall, as well as 38 firms with whom the College's Office of Corporate Relations had ongoing relationships. From the surveys we learned that familiarity with the disciplinary areas of material properties, electrodynamics, and acoustics were most frequently cited. The most commonly mentioned instrumentation skills were in embedded system design and real-time coding, along with familiarity with 3D printing and rapid prototyping. Familiarity with the computational tools of machine learning, as well as experience in offline analysis of complex data were frequently mentioned. Knowledge of the general principles of business and commerce, as well as familiarity with the tools of quality control and assurance were also important. An ability to communicate clearly and collaborate effectively were nearly universally offered as necessary skills for prospective employees.

It is natural to wonder about the relative attractiveness of a broadly-trained physicist and a more narrowly trained engineer to a prospective employer. In a recent conversation, the Chief Technology Officer of a local startup explained that “nobody has a degree in what we do, so we need [new hires] to be able to learn.” In addition, a physicist with a graduate degree will have “non-trivial project experience,” which is highly valued. A well-trained master’s graduate with project experience can “get stuff done.” His company hires master’s graduates into positions with titles like “research physicist” and “research engineer.”

Through academic advising, students in the proposed concentration will be asked to identify a preferred industry sector early in the first semester, and to inform their course selections with the (disciplinary) needs of that sector. The other skills—instrumentation, computation, communication, collaboration, and commerce—will naturally develop through engagement with the project and device courses.
To assist students with job placement, Physics faculty and staff will work closely with Engineering Career Services and staff from the College of Engineering Center for Professional and Executive Training and Education. This will include realizing opportunities for project experiences that will put students in direct contact with potential employers. We hope to develop further industry contacts through our own efforts and with the assistance of members of our advisory board, once that has been established.

Instructional Resources

Will there be any reduction in other course offerings, programs or concentrations by your department as a result of this new program/proposed change?

No

Does this new program/proposed change result in the replacement of another program?

No

Does the program include other courses/subjects impacted by the creation/revision of this program?

No

Program Regulation and Assessment

Briefly describe the plan to assess and improve student learning, including the program’s learning objectives; when, how, and where these learning objectives will be assessed; what metrics will be used to signify student’s achievement of the stated learning objectives; and the process to ensure assessment results are used to improve student learning. (Describe how the program is aligned with or meets licensure, certification, and/or entitlement requirements, if applicable).

We can summarize the program’s learning objectives this way: 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.

The program curriculum comprises 16 credit hours of core courses, 12 credit hours of technical electives, and four hours of professional development courses. Each of the above learning objectives is addressed by at least four of the courses to be taken by students. Most courses will require students to complete biweekly (graded) problem sets, a midterm exam, and a comprehensive final examination. These instruments will serve as the primary assessment tools for the learning objectives spanned by those courses.

Outcomes assessment in the two-semester course Physics 523, “Instrumentation and Applied Physics Project,” will be done somewhat differently. We will define approximately a dozen milestones that collaborative project groups are expected to meet; an example is “Create a draft project timeline, with dependencies.” The work presented to represent achievement of the goals of a milestone will be evaluated by course staff. In addition, each project group will be expected to give several “technical culture” oral presentations describing the arcana of the devices and techniques associated with their projects to the rest of the class. These too will be evaluated by course staff. Midway through the first semester of Physics 523 each group

will be required to submit a detailed written project proposal and deliver (consistent with the constraints of any applicable nondisclosure agreements) an oral presentation to the class describing their project plans. The proposal will be reviewed by course staff, and revised as appropriate following review. At the end of the first semester each project group will submit a written project status document and deliver an oral presentation about their progress to date to the class. These will be evaluated by course staff. The first draft of a final project report will be required of students four weeks before the end of the second semester; it will be reviewed by course staff and then revised. A second draft will be required two weeks before the end of the second semester; it will undergo peer review by other students, as well as the course staff. The final project report and oral presentation to the class will be due the last week of the second semester. We will also require each project group to meet informally with the course staff every week. These discussions of achievements and challenges will help us understand in detail how well each collaboration functions, as well as alerting us to any technical issues that might arise, and be beyond the capabilities of students to resolve on their own. All of these activities—reports, presentations, achievement of milestone goals, weekly conferences with staff, and successful completion of the project—will allow us to assess learning outcomes in detail.

We will conduct lengthy exit interviews with each group at the end of the spring semester to learn in detail what, in the minds of students, worked well, and what should be improved. We also hope, once the program has been running for a year, to interview the employers who have hired our graduates to better understand whether or not our program teaches skills that are highly valued by employers.

Improving the program will be an iterative process, based on our experiences with each student cohort. Since we will not be training students to sit for professional licensing exams, we will not be overly focused on the degree of congruence between licensure and program content.

Is the career/profession for graduates of this program regulated by the State of Illinois?

No

Program of Study

“Baccalaureate degree requires at least 120 semester credit hours or 180 quarter credit hours and at least 40 semester credit hours (60 quarter credit hours) in upper division courses” (source: https://www.ibhe.org/assets/files/PrivateAdminRules2017.pdf). For proposals for new bachelor’s degrees, if this minimum is not explicitly met by specifically-required 300- and/or 400-level courses, please provide information on how the upper-division hours requirement will be satisfied.

All proposals must attach the new or revised version of the Academic Catalog program of study entry. Contact your college office if you have questions.

For new programs, attach Program of Study

AcademicCatalog.docx

Catalog Page Text - Overview Tab

Text for Overview tab on the Catalog Page. This is not official content, it is used to help build the new catalog page for the program. Can be edited in the catalog by the college or department.

For additional details and requirements, please refer to the web page of the degree’s home unit and the Graduate College Handbook.

Statement for Programs of Study Catalog

Code	Title	Hours
PHYS 523	Instrumentation and Applied Physics Project (Instrumentation and Applied Physics Project, 4 credit hours in two consecutive semesters)	8
PHYS 524	Survey of Instrumentation and Laboratory Techniques (Survey of Instrumentation and Laboratory Techniques)	2
PHYS 525	Survey of Fundamental Device Physics (Survey of Fundamental Device Physics)	2

PHYS 503	Instrumentation Physics Applications of Machine Learning (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	

Program Relationships

Corresponding Program(s):

Corresponding Program(s)
Engineering, MEng

Program Features

Academic Level

Graduate

Is This a Teacher Certification Program?

No

Will specialized accreditation be sought for this program?

No

Additional concentration notes (e.g., estimated enrollment, advising plans, etc.)

The Department of Physics will be responsible for the administration of the proposed Concentration in Instrumentation and Applied Physics under the Master of Engineering in Engineering degree program, including admission and advising of students in the program. It is anticipated that enrollment will ramp up to an average of 30-50 students in the first three years of the program, with a long-term steady-state of 50 students per year. Students enrolled in this concentration will have a large range of options available to fulfill the elective course requirement, implying minimal impact on enrollments in courses offered by units outside Physics.

Delivery Method

This program is available:

On Campus - Students are required to be on campus, they may take some online courses.

Enrollment

Number of Students in Program (estimate)

Year One Estimate

10

5th Year Estimate (or when fully implemented)

50

Budget

Will the program or revision require staffing (faculty, advisors, etc.) beyond what is currently available?

Yes

Please explain/describe:

The Department of Physics expects to hire an instructor with significant industry experience to help teach the required project course. Existing faculty resources should be adequate for servicing the increased demand on physics courses anticipated through this program. Tuition revenues will fund additional teaching assistant and teaching faculty support as necessary.

Financial Resources

How does the unit intend to financially support this proposal?

The unit is requesting self-supporting program status for this concentration. Students enrolled in this concentration will pay tuition and will not be eligible for BOT tuition waivers. The Grainger College of Engineering will use some of the graduate tuition dollars returned to the college from the Office of the Vice Provost for Budget and Resource Planning to provide the Department of Physics with resources needed to support the proposed curriculum. Graduate tuition funds returned to the college from campus are considered state recurring funds that may be used to fund faculty and lecturer salaries, support instruction, or at the discretion of the Physics Department Head in a manner consistent with campus policy.

Will the unit need to seek campus or other external resources?

No

Attach letters of support

MENG Applied Physics SS Form.pdf

Is this program requesting self-supporting status?

Yes

Resource Implications

Facilities

Will the program require new or additional facilities or significant improvements to already existing facilities?

No

Technology

Will the program need additional technology beyond what is currently available for the unit?

No

Non-Technical Resources

Will the program require additional supplies, services or equipment (non-technical)?

No

Resources

For each of these items, be sure to include in the response if the proposed new program or change will result in replacement of another program(s). If so, which program(s), what is the anticipated impact on faculty, students, and instructional resources? Please attach any letters of support/ acknowledgement from faculty, students, and/or other impacted units as appropriate.

Faculty Resources

Please address the impact on faculty resources including any changes in numbers of faculty, class size, teaching loads, student-faculty ratios, etc. Describe how the unit will support student advising, including job placement and/or admission to advanced studies.

The proposed program will not adversely impact faculty resources or the student-to-faculty ratio. The proposed curriculum comprises existing courses and four new courses whose organization will capitalize on the research experiences of current faculty. Existing capacity and controlled enrollments will ensure the overall quality of experience for students in the program. No changes are necessary to existing functions or programs. The department will leverage the shared services for MEng programs in The Grainger College of Engineering's Office of Graduate, Professional, and Online Programs to provide administrative support for the program, including in support of student recruitment, career advising, and professional development.

Library Resources

Describe your proposal's impact on the University Library's resources, collections, and services. If necessary please consult with the appropriate disciplinary specialist within the University Library.

Students in the proposed concentration will make use of the same library resources available to other (undergraduate and graduate) students with no anticipated impact outside of the additional enrollment.

EP Documentation

EP Control Number

EP.22.013

This proposal requires HLC inquiry

No

DMI Documentation

Program Reviewer Comments

Keri Pipkins (kcp) (Tue, 13 Oct 2020 18:10:23 GMT): Rollback: Department reevaluating program.

Key: 959

ILLINOIS

GRADUATE COLLEGE

110 Coble Hall, MC-322
801 S. Wright St.
Champaign, IL 61820

PROGRAM TUITION WAIVER POLICY PROPOSAL

Proposals to establish or revise tuition waiver policy for a graduate program will follow a shared governance approval process (Department, School, College, Graduate College).

Definitions of Tuition Waiver Policy Designations:

Traditional Programs. Programs either designated as generating **full or base-rate** tuition waivers. Base rate waivers waives only the Resident Graduate Base tuition amount. Non-Residents or students in a program with an additional tuition differential will be responsible for the remaining portion of tuition.

Reimbursable Programs. Programs identified as programs that would be reimbursed from an appointing unit outside their academic college.

Cost-recovery and self-supporting programs. Students in approved cost-recovery and self-supporting programs are not eligible to receive tuition and fee waivers except statutory waivers. Students in these programs are not eligible to hold a waiver generating graduate appointment (Assistantship or Fellowship). Full time employees may be admitted to these programs, but their employee waiver is not eligible for use towards a program with this designation.

Additional information related to these tuition waiver designations can be found here: http://www.grad.illinois.edu/gradhandbook/2/chapter7/tuition-waivers#otherprovisions.

PROGRAM INFORMATION

COLLEGE OR SCHOOL: Grainger College of Engineering

PROGRAM(s) (Include Program Codes if applicable):
Graduate Concentration in Instrumentation and Applied Physics in the GCOE MENG

REQUESTED DESIGNATION (Select desired designation type):

Self-Supporting

Comments:

JUSTIFICATION: On a separate sheet, please address the following.

1. Describe the reasons for this request and explain: (a) the pros and cons of the classification requested, and (b) how the requested classification will benefit and not adversely affect the academic quality of the program.

2. What type of financial assistance will be offered to students in the program?

3. Has this program had past practice of offering graduate assistantships? If so, please describe.

4. What provisions will be made to communicate the new classification to prospective and newly admitted students?

APPROVALS: (May use Adobe Signature or print and sign the document)

Department Executive Officer Signature and Date: Matthias Grosse Perdekamp Digitally signed by Matthias Grosse Perdekamp Date: 2021.05.04 16:20:56 -05'00'

Disciplinary College Signature and Date: Harry Dankowicz Digitally signed by Harry Dankowicz Date: 2021.05.06 07:08:00 -05'00'

Graduate College Signature and Date: Allison McKinney 9/3/21

1. **Describe the reasons for this request and explain: (a) the pros and cons of the classification requested, and (b) how the requested classification will benefit and not adversely affect the academic quality of the program.**

(a) The proposed concentration is not a research-oriented program. It is designed so that it can be completed in two semesters in order to address an academic training gap at a professional level. The requested classification enhances the educational experience of students and employability of graduates who, after attaining a BS degree in engineering or equivalent field, will benefit from the differentiated value provided by this advanced professional degree. The requested classification is not expected to adversely impact recruitment of students interested in a research oriented track with a traditional tuition model, nor significantly limit the potential pool of prospective students to the professionally-oriented track.

(b) The Grainger College of Engineering will use some of the graduate tuition dollars returned to the college from the Office of the Vice Provost for Budget and Resource Planning to provide the participating academic units with resources needed to support the proposed curriculum. Graduate tuition funds returned to the college from campus may be used to fund faculty and lecturer salaries, support instruction, or at the discretion of the participating Department Heads in a manner consistent with campus policy on use of such funds.

2. **What type of financial assistance will be offered to students in the program?**

The program may elect to offer scholarships to students in this program in an effort make the program more attractive and affordable for highly-qualified students and/or students from backgrounds underrepresented in STEM fields.

3. **Has this program had past practice of offering graduate assistantships? If so, please describe.**

This program will not offer graduate assistantships.

4. **What provisions will be made to communicate the new classification to prospective and newly admitted students?**

The self-supporting classification will be clearly explained on the program's website and in any and all communications to prospective students.

department head: Matthias Grosse Perdekamp
director of graduate studies: Lance Cooper
director of MEng program: TBD

overview of admissions & requirements:
https://instrumentationandappliedphysicsmeng.engineering.illinois.edu/admissions/
overview of grad college admissions & requirements: https://grad.illinois.edu/admissions/apply

department website: http://physics.illinois.edu
program website: https://instrumentationandappliedphysicsmeng.engineering.illinois.edu/
department faculty: https://physics.illinois.edu/people/directory/

college website: https://grainger.illinois.edu/

contact: Wendy R Wimmer
address: 227 Loomis Lab, 1110 W Green St, Urbana, IL 61801
phone: (217) 333-3645
email: grad@physics.illinois.edu

The MEng in Engineering, Instrumentation and Applied Physics 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. Other concentrations under the MEng in Engineering major include Aerospace Systems Engineering, Energy Systems, Plasma Engineering, and Railway Engineering.

Admission Requirements

Students with bachelor's or master's degrees in engineering or related fields will be considered for admission if they have a grade point average of at least 3.00 (A = 4.00) for the last two years of undergraduate study. Admission is possible for the spring term, but most admissions are for the fall term. Full details of admission requirements are on the Instrumentation and Applied Physics Concentration website.

All applicants whose native language is not English are required to submit the results of the TOEFL or International English Language Testing System (IELTS) as evidence of meeting the English proficiency requirements for full admission status. Under certain circumstances applicants may be exempt from the TOELF/IELTS requirement.

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.

Other Graduate Programs in the Department of Physics

degrees:

Physics, MS

Physics, PhD
optional concentrations:
Computational Science and Engineering

Teaching of Physics, MS

The Department of Physics offers graduate programs leading to the degrees of Master of Science and Doctor of Philosophy in Physics, Master of Science in Teaching Physics, and Master of Engineering in Engineering with a concentration in Instrumentation and Applied Physics. The Department is actively developing a new paradigm for graduate physics education and research for the 21st century, aimed at enhancing interdisciplinary interactions and creating an integrated approach to educational and research training. Outstanding graduate research opportunities are available in many subdisciplines of physics, including condensed matter physics, high energy and nuclear physics, astrophysics, atomic physics, molecular and optical physics, complex systems, quantum information, biological physics, physics education research.

Students may select experimental, theoretical, or computational thesis projects. Multidisciplinary projects are especially encouraged, and, with the consent of other departments, students may earn master's degrees in areas such as materials science and engineering, or computer science, simultaneously with their PhD degrees in physics.

Opportunity also exists for specializing in energy and sustainability engineering via the

Energy and Sustainability Engineering (EaSE) Graduate Certificate Option

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