Professional Master of Science in Physics

UW Physics Department
UW Professional & Continuing Education

Website: http://www.physicsmasters.uw.edu

Autumn 2022
Offers BS, Professional MS, and PhD programs
  - But there is no full-time/daytime MS program

Faculty
  - UW Physics faculty recognized internationally as leaders in theoretical and experimental research
    - Two Nobel prize winners (H. Dehmelt, D. Thouless)
  - Students can participate in leading-edge research conducted by faculty, and learn about the latest scientific discoveries
Professional MS in Physics (PMSP) Program

• Started in 1970s – program upgraded in 2009
• Growing demand for Professional Science Master’s degree in STEM fields
  – Employers (industry, R&D labs) recognize value
• Students come from many sources:
  – Employees of regional high-tech firms
  – High school teachers
  – Military personnel
  – Recent BS graduates
Motivations & Results

• Student motivations
  – Professional and career advancement
  – Seek qualifications for more interesting assignments
  – Career re-direction
  – Simple intellectual interest

• Graduates succeed!
  – Promotions with current employer
  – Secure new jobs
  – Define new career paths in R&D or teaching
Administered jointly by Physics Department and UW PCE

• UW Professional & Continuing Education (PCE):
  – PMSP is one of more than 80 graduate degree programs administered by PCE
  – Course registration is handled by PCE

• All academic aspects are handled by Physics Dept
• All courses taught by full-time regular Physics faculty
MS degree awarded

• Upon successful completion, you are awarded the **MS in Physics** by the **UW Graduate School**
  – Same diploma as any full-time/daytime UW MS student

• Designed as terminal MS degree, separate from Physics PhD program
  • Not designed as preparation for PhD studies
    – However, some PMSP alumni have gone on to PhD programs at UW and elsewhere
What BS degree is required to apply?

Not just for physics majors

• BS degree in a physical science, mathematics, or engineering
  – Not limited to applicants who majored in Physics as undergraduates
  – Not limited to students who got top grades as undergrads...
  – Not limited to recent graduates — some of our students received their BS degree 5 ~ 20 years ago
How to attend class?

• All classes meet evenings, on the UW Seattle campus

• PMSP *lecture* classes offer optional online attendance
  
  – Attend classes from home, work, or anywhere with an internet connection, using any common browser
  
  • *Zoom video conferencing* provides audio and video of the instructor, slides, chat window, and recordings of class sessions

  – Classes are not *designed* as online-only; we recommend in-person or real-time online attendance whenever you can

  – For courses with labs or other hands-on work, on-campus attendance may be required for some sessions
Admission Requirements

• **Reasonable** grades in relevant courses
  – B (3.0) grade average in 300-400 level undergrad physics courses or equivalent engineering courses
    • UW Graduate School requires 3.0 overall GPA in last 60/90 credits
    • Physical science and most engineering (EE, ME, CE, ChemE, etc.) BS programs include appropriate courses

• Statement of purpose
  – Your reasons to join the PMSP program
    • How the MSP will connect to your career goals
    • **NOT an essay contest:** used only for better advising

• GRE score is **not** required (or considered)
Admissions FAQs

• What if my undergraduate degree is not in a physical science or engineering?
  – You need physics classes beyond the intro/100 course level, with good grades (GPA 3 or higher)
    • Most engineering programs include equivalent courses (mechanics, E&M, thermodynamics, etc.)
      – You can send your transcripts (informal, personal copy) to us for advice on your preparation

• What if I got my BS degree years ago?
  – Many of our students start after a decade or more in the workplace
    • Classes are designed taking into account your need for review, especially in relevant math
Admissions FAQs

• Can I complete my degree from outside the Seattle area?
  – All lecture courses offer optional attendance via Zoom
    • Slides, audio and chat windows are recorded and can be viewed later
  – No lab courses are required for graduation
  – For your final independent study (capstone) project, you will need to find a topic that you can pursue remotely, and a faculty mentor willing to supervise you via email or videoconferencing
Admissions FAQs

• What if work or family obligations come up and I need to take time off?
  – No problem! You can request on-leave status any time
    • MS students must be registered for credits OR be on-leave every term except summers, to maintain their status
  – However: the UW Graduate School requires you to complete your degree within 6 years of starting
Admissions FAQs

• What should my personal statement include?
  – The personal statement is not an essay contest, as with some college applications!
    • We use it only for advising purposes, to make sure your stated goals and expectations match our program’s capabilities

• Can I contact you before applying?
  – You are welcome to. Please email emsp@uw.edu briefly describing your situation (location, previous education, goals) and we can provide pre-application advising
MS Degree Requirements

1 - Complete three of the four core courses (4 credits each)
   - PHYS 543: Electromagnetic Theory
   - PHYS 540: Quantum Physics
   - PHYS 544: Applications of Electromagnetic Theory
   - PHYS 541: Applications of Quantum Physics

   Offered every year, Autumn and Winter

2 - Complete at least 18 credits in graded courses
   - PMSP offers one core and one elective course per quarter
     • You may take elective courses in other departments, with prior approval

3 - Complete a final independent study project
   - Submit project report (not a formal MS thesis)
   - Oral exam on your independent study topic

4 - Accumulate at least 36 credits (courses plus independent study)
Electives recently offered

- Quantum Computing
- Contemporary Optics
- Physics of Lasers
- Numerical Methods for Physics Data Analysis
- Nuclear physics: sources, detectors, and safety
- Acoustics
- Physics of Renewable Energy Sources
- Radiation and Radiation Detectors
- Condensed Matter Physics
Customize your program with independent study courses

• Exploratory independent study courses (typically 1 or 2 credits)
  – Mentored by a Physics faculty member
  – Customize your studies to match your personal goals
  – Choose a topic of your own or work with faculty on their research program in preparation for a final project

• Final Independent Study Project (typically 8 - 18 credits)
  – Work with faculty in Physics, or professors in other departments
    • MS students typically participate in ongoing research projects with faculty and PhD students
  – Or, define your own project topic
    • Some do job-related research under faculty supervision
Choose a research area that fits your goals

UW Physics Department Research Groups

Browse research group web pages to identify faculty members who may be mentors for independent study projects:

- Astrophysics
- Atomic Physics
- Biological Physics
- Collider Physics
- Condensed Matter Experiment
- Condensed Matter Theory
- Energy Sciences
- Gravitational Physics
- Nanoscale Physics
- Neutrino Physics
- Nuclear Experiment
- Nuclear Theory
- Particle Experiment
- Particle Theory
- Physics Education
- Precision Measurement
- Quantum Information

For complete list, see https://phys.washington.edu/research
Physics Adjunct Faculty in other departments

- See the Physics Department website for list of faculty in other departments who are *adjuncts* in Physics (can supervise Physics grad students):

  - Astronomy
  - Aeronautics and Astronautics
  - Applied Mathematics
  - Atmospheric Sciences
  - Bioengineering
  - Center for Nanotechnology

  - Chemistry
  - Earth and Space Sciences
  - Electrical Engineering
  - Materials Sciences
  - Physiology and Biophysics
  - Radiology

- We also have *Affiliate Professors* outside UW, at National Labs (PNNL, Argonne, Los Alamos), and at other institutions
Your final project

• Recruit a Physics faculty member to be your supervisor/adviser/mentor

• Schedule and enroll in independent study (PHYS 600) courses each term (typically 2~8 credits/term)

• Prepare written report to summarize project and findings
  – Typically 20–50 pp, formatted as a technical report
  – Final oral examination:
    • Presentation of project and findings (typically 30 min.)
    • Questions posed by panel of two or more faculty
    • Submit final written report
Program costs

- PMSP is a self-sustaining (not state-supported), fee-based degree program
- Tuition is $779/credit
  - Tuition is intended to track UW resident graduate tuition
  - Total course fees/tuition for degree program (36 credits) is about $28K
  - Limited financial aid
    - Loans are available for some students
    - No scholarships or assistantships available at this time
Admissions

• For admission to the *Professional MS in Physics* program, submit your application to the UW Graduate School online:

  [http://www.grad.washington.edu/admissions](http://www.grad.washington.edu/admissions)

• Application deadline is September 1

  – *Most students start Autumn Quarter, but you may request deferral to Winter or Spring (but not Summer) Quarter*
Contact Information

Website: www.physicsmasters.uw.edu

For questions about academics, admissions criteria, course offerings, prerequisites, independent study:

- Prof. Anna Goussiou, Faculty Coordinator for PMSP
  emsp@uw.edu

To get email notices about information meetings, upcoming application deadlines, etc.:
www.physicsmasters.uw.edu/email-signup/

For all questions about program requirements, application forms and admissions process:

- Catherine Provost, Graduate Student Advisor, Physics Dept
  (206) 543-2488
cuala@uw.edu

For all questions about registration and payment options:

- Marissa Heringer, Operations Manager, PCE
  marissa3@uw.edu