

Professional Master of Science in Physics

UW Physics Department

UW Professional & Continuing Education

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

Autumn 2022

UW Physics Department

- 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

} Alternate years,
Spring term
- 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 | Nanoscale Physics |
| Atomic Physics | Neutrino Physics |
| Biological Physics | Nuclear Experiment |
| Collider Physics | Nuclear Theory |
| Condensed Matter | Particle Experiment |
| Experiment | Particle Theory |
| Condensed Matter Theory | Physics Education |
| Energy Sciences | Precision Measurement |
| Gravitational Physics | 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>
- 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