MEDICAL PHYSICS, PHD

Admission Requirements

Medical physicists are professionals with an MS or PhD degree, specializing in the technical and clinical aspects of diagnosis and therapy. They work alongside MDs and technologists, contributing to technical areas such as imaging, radiation therapy, and radiation safety. The field is governed by organizations like the American Association of Physicists in Medicine (AAPM), the American Board of Radiology (ABR), and CAMPEP (Commission on Accreditation of Medical Physics Educational Programs). The Medical Physics field benefits significantly from NIH funding in radiation and radiological sciences, placing JHU in a competitive position among institutions. For application, apply now (Application Management (https://applygrad.jhu.edu/apply/?sr=61ab0eb5-7ac7-4dc0-9347-062f46b0ca6a)).

Program Requirements

The Medical Physics PhD program at Johns Hopkins is a five-year, dual-track program. It offers two tracks: the Clinical–Research track (CAMPEP track) and the Research track (non-CAMPEP track).

A. Admission

Students are directly matched to a principal investigator's (PI) lab. The Clinical–Research track (CAMPEP track) requires a background in physics, while the Research track (non-CAMPEP track) accepts students from any background.

B. Course Training (Years 1-2)

The initial two years consist of coursework, with at least 36 credits required (18 core and 18 elective), and maintaining a minimum GPA of 3.0. Students complete CAMPEP-accredited courses and conduct research projects under the guidance of their PI. They must also pass the Doctoral Board Oral (DBO) exam.

C. Research Training (Years 3-5)

In the Clinical–Research track (CAMPEP track), students prepare for the ABR Part 1 exam, whereas the Research track (non-CAMPEP track) is focused solely on research. Annual Individual Development Plan (IDP) meetings and thesis committee meetings are conducted to ensure progress. Both tracks involve research projects under the PI and culminate in writing and defending a thesis.

Upon completion, students in the Clinical–Research track (CAMPEP track) are qualified for Medical Physics residency, while those in the Research track are not. The Research track students (non-CAMPEP track) can apply to switch to the Clinical-Research track (CAMPEP track) once they fulfill the requirements the CAMPEP required undergraduate physics courses.

Curriculum

The Medical Physics PhD program at Johns Hopkins includes a CAMPEP core graduate curriculum, totaling 20 credits, which provides foundational knowledge in the field and the curriculum requires the completion of 36 credits and a research thesis. The core courses include:

- Radiological Physics and Dosimetry
- Radiation Protection and Safety
- Fundamentals of Medical Imaging
- Radiobiology
- Medical Anatomy and Physiologic Processes
- Radiation Therapy Physics
- Nuclear Medicine Imaging
- Radiopharmaceutical Therapy
- Professionalism and Ethics

In addition to the core courses, students have a range of elective courses to choose from. Electives are available in various disciplines, including for example:

Public Health (Biostatistics) at the East Baltimore campus:

- Statistics for Laboratory Scientists

Biomedical Engineering at the Homewood campus:

- Systems Pharmacology and Personalized Medicine
- Introduction to Neuro-Image Processing
- Principles and Applications for Modern X-ray Imaging and Computed Tomography
- Imaging Instrumentation

Electrical and Computer Engineering at the Homewood campus:

- Medical Image Analysis
- Ultrasound and Photoacoustic Beamforming
- Machine Learning for Medical Applications

These core and elective courses equip students with the skills and knowledge required for careers in research, clinical practice, or industry within the medical physics domain.