Medical Physics

The Department of Radiation Oncology at the School of Medicine currently offers three programs for graduate and postgraduate physics students who are interested in exploring pathways to prepare for residency programs as well as for careers in the field of medical physics: the Master of Science in Medical Physics (MSMP) (https://radonc.wustl.edu/education/master-of-science-in-medical-physics/), the new Doctor of Philosophy (PhD) in Medical Physics (https://radonc.wustl.edu/education/doctor-of-philosophy-phd-in-medical-physics/), and the Post-PhD Graduate Certificate in Medical Physics (https://radonc.wustl.edu/education/post-phd-graduate-certificate-in-medical-physics/).

Contacts for Programs

Program Director
Michael Altman, PhD

Associate Program Director
Tiezhi Zhang, PhD

Program Coordinator
Julie Follman, MBA

Degrees & Offerings

- Master of Science in Medical Physics (http://bulletin.wustl.edu/medicine/degrees-offerings/msmp/)
- Doctor of Philosophy (PhD) in Medical Physics (https://radonc.wustl.edu/education/doctor-of-philosophy-phd-in-medical-physics/)
- Post-PhD Graduate Certificate in Medical Physics (http://bulletin.wustl.edu/medicine/degrees-offerings/med-phys-grad-cert/)

Research

Master of Science in Medical Physics

Established in 2020, the MSMP program offers two different pathways to allow students to choose either a thesis option or a clinical option. Students who choose the thesis pathway will be required to complete 6 credits of thesis research, with the option for additional research opportunities over the summer semester as part of the 30-credit requirement. Students who choose the clinical pathway will be required to complete a 1-credit clinical rotation and a 3-credit clinical project, with the option for additional clinical rotations over the summer. Each pathway takes two years to complete.

Doctor of Philosophy (PhD) in Medical Physics

New in 2022, the Doctor of Philosophy (PhD) in Medical Physics program is designed for full-time study with a minimum of 70 credit units required for degree completion. The program is comprised of 34 credit units of didactic course work, which are largely completed over the first two years of the program; this includes 22 credit units of medical physics “core” classes and 12 credit units of elective course work, as well as a minimum of 36 credit units of thesis research. The program commences in the fall semester, and didactic courses will run over traditional 16-week schedules during the fall and spring semesters. During the summer, students will be expected to work on their thesis research projects. Clinical shadowing opportunities will also be available for those who have interest.

Post-PhD Graduate Certificate in Medical Physics

The medical physics division in the Department of Radiation Oncology currently provides research and training opportunities to a large number of PhD researchers in different areas of science and engineering as applied to radiation oncology. The Department of Radiation Oncology established the Post-PhD Graduate Certificate in Medical Physics program in 2017, with the intent of providing a pathway for postdoctoral fellows to enter into clinical physics residencies.

Our post-PhD certificate program focuses on providing students with the medical physics background necessary for future success in medical physics while also offering students the opportunity to perform cutting-edge research in patient-focused areas. Didactics include 18 credits and can be completed over the course of one or two years.

Faculty

Program Director
Michael Altman, PhD
Associate Professor of Radiation Oncology
BA, Physics, University of Chicago, 2002
MS, Physics, Drexel University, 1999
PhD, Medical Physics, University of Chicago, 2010
Medical Physics Residency, Henry Ford Health System, 2012

Associate Program Director
Tiezhi Zhang, PhD (https://radonc.wustl.edu/people/tiezhi-zhang-phd/)
Associate Professor of Radiation Oncology (primary appointment)
BS, Physics, Jilin Medical University, 1994
MS, Physics, Drexel University, 1999
PhD, Medical Physics, University of Wisconsin–Madison, 2004
Instructors

Jose Garcia-Ramirez, MSc (https://radonc.wustl.edu/people/jose-garcia-ramirez-ms/)
Assistant Professor of Radiation Oncology
BS, Physics, University of Puerto Rico, 1995
MS, Medical Radiation Physics, Finch University of Health Sciences (Rosalind Franklin University), 1997

Yao Hao, PhD
Instructor in Radiation Oncology (primary appointment)
BS, Physics, Shanxi University, 2004
MA, Logic, Shanxi University, 2007
PhD, Medical Physics, University of Massachusetts, 2016

Joseph O’Sullivan, PhD (https://engineering.wustl.edu/faculty/Joseph-Osullivan.html)
Samuel C. Sachs Professor of Electrical Engineering
BS, Electrical Engineering, University of Notre Dame, 1982
MS, Electrical Engineering, University of Notre Dame, 1984
PhD, Electrical Engineering, University of Notre Dame, 1986

Naim Ozturk, PhD
Chief Physicist, Cox Health Springfield
BS, Physics, Bogazici University (Turkey), 1984
MS, Physics, University of Toledo, 1989
PhD, Physics, University of Toledo, 1993
MS, Medical Physics, East Carolina University, 2003

Michael Prusator, PhD
Assistant Professor of Radiation Oncology
BS, Chemistry, University of the Ozarks, 2012
MS, Radiological Sciences, University of Oklahoma, 2014
PhD, Radiological Sciences, University of Oklahoma, 2018

Buck Rogers, PhD (https://radonc.wustl.edu/people/buck-rovers-phd/)
Professor of Radiation Oncology (primary appointment)
Adjunct Professor of Chemistry (courtesy affiliation)
Professor of Radiology
BS, Chemistry, Loyola University Chicago, 1989
MA, Chemistry, Washington University in St. Louis, 1991
PhD, Inorganic Chemistry, Washington University in St. Louis, 1995

David Strait, PhD (https://anthropology.wustl.edu/people/david-strait/)
Professor of Anthropology
BA, Anthropology, Harvard College, 1991
MA, Anthropological Sciences, State University of New York at Stony Brook, 1995
PhD Anthropological Sciences, State University of New York at Stony Brook, 1998

Courses

producing devices such as external beam, brachytherapy, protons and in radiation therapy for the treatment of cancer. Ionizing radiation learn clinical applications of radiation dose measurements as used techniques and bring them into the clinical realm. The students will This course is designed to build on the concept of radiation dosimetry credit 2 units.

The student will rotate through various areas within the Radiation Therapy Clinic and develop an understanding of the applications of physics in the use of radiation for the treatment of cancers. This will include simulation, quality assurance of various imaging and radiation sources, dose calculation, intensity modulation treatments, radiosurgery, stereotactic body radiotherapy, brachytherapy, radiopharmaceutical therapy, and more. Prerequisite: MP502, MP506, and MP521; Permission of the program director credit 2 units.

charged particles, imaging modalities, simulation, radiation delivery, treatment verification imaging, quality assurance, motion management and image-guided techniques will be the major focus. Prerequisite: MP502; Permission of the program director.

M91 MedPhys 521 Radiation Protection and Safety

This course prepares students to critically evaluate ethical, regulatory and professional issues and for leadership in clinical practice and research. The principal goal of this course is to prepare students to recognize ethics and compliance resources in clinical research and the situational factors that give rise to them, to identify ethics and compliance resources, and to foster ethical problem-solving skills. In addition, the course introduces professionalism, core elements, common traits of the medical physics profession, confidentiality, conflict of interest, interpersonal interactions, negotiations and leadership skills. Characteristics of successful leadership are also identified. Interaction with patients, colleagues, vendors, and clinic staff will also be emphasized. Prerequisite: Permission of the program director. Credit 1 unit.

M91 MedPhys 506 Radiation Oncology Physics

This course is designed to build on the concept of radiation dosimetry techniques and bring them into the clinical realm. The students will learn clinical applications of radiation dose measurements as used in radiation therapy for the treatment of cancer. Ionizing radiation producing devices such as external beam, brachytherapy, protons and