MEDICAL PHYSICS, PHD

The Department of Medical Physics at UW–Madison's School of Medicine and Public Health is the first medical physics department in the United States and home to the largest group of medical physics doctoral students in the world. Achievement of the PhD degree in this department reflects strong scholarship and research in the physics and engineering of diagnostic and therapeutic systems. Graduates are prepared for teaching and research positions in universities, national laboratories, and the medical and nuclear technology industries, as well as for admission into medical physics residency programs to become board–eligible for clinical medical physics positions.

Faculty in the department focus on discoveries in imaging and therapy systems that translate into new clinical techniques or the development of new products through industry collaboration and venture entrepreneurship. The department's faculty expertise spans fields such as x-ray physics, computed tomography (CT), magnetic resonance imaging (MRI), positron emission tomography (PET) imaging, biomagnetism, ultrasound, radiation dosimetry, radiation treatment planning, and radiobiology. Students benefit from a curriculum that provides in-depth training in these specialties, supported by advanced resources, including the Medical Radiation Research Center and an Accredited Dosimetry Calibration Laboratory. Additional facilities, such as the PET radiotracer production unit and Small Animal Imaging Facility, along with clinical scanners from all major medical imaging modalities, offer unique research and clinical training opportunities.

Collaborations with departments like Radiology, Human Oncology, and Biomedical Engineering further enrich the training experience, providing access to sophisticated clinical resources and fostering interdisciplinary research. The program's comprehensive research focus prepares students to become leaders in medical physics, with many alumni pursuing impactful careers in academia, clinical practice, and industry.

ADMISSIONS

ADMISSIONS

Please consult the table below for key information about this degree program's admissions requirements. The program may have more detailed admissions requirements, which can be found below the table or on the program's website.

Graduate admissions is a two-step process between academic programs and the Graduate School. *Applicants must meet* the minimum requirements (https://grad.wisc.edu/apply/requirements/) of the *Graduate School as well as the program(s)*. Once you have researched the graduate program(s) you are interested in, apply online (https://grad.wisc.edu/apply/).

Requirements	Detail
Fall Deadline	December 1
Spring Deadline	The program does not admit in the spring.
Summer Deadline	The program does not admit in the summer.

GRE (Graduate Record Examinations)	Not required.
English Proficiency Test	Refer to the Graduate School: Minimum Requirements for Admission policy: https:// policy.wisc.edu/library/UW-1241 (https:// policy.wisc.edu/library/UW-1241/).
Other Test(s) (e.g., GMAT, MCAT)	n/a
Letters of Recommendation Required	3

Admitted applicants entering the medical physics program must have acquired a strong foundation in basic physics and mathematics but are welcome to have come from a range of undergraduate majors in STEM. While a bachelor's degree in physics is considered the most common preparation, other physical science majors such as engineering, computer science, mathematics, chemistry, etc, are considered, as long as the candidate has coursework equivalent to a minor in physics. The minimum expected physics preparation is two introductory college physics courses, a modern physics course or individual courses covering electromagnetism, atomic structure, and quantum theory, and a total of three upperlevel physics courses or equivalent. Additionally, applicants should be proficient in mathematics, including multi-variable calculus, differential equations, Fourier transforms, and linear algebra. Research in medical physics touches on artificial intelligence, chemistry, nuclear engineering, and electrical engineering and so proficiency in one of these areas is considered positively. Exposure to organic chemistry, undergraduate biology, and physiology is advantageous. Applicants who do not have the equivalent of a minor in physics may be admitted conditionally. If so, additional course work in physics must be taken before the student can take the qualifying exam at the end of the 2nd year of study. The qualifying exam emphasizes the content of MED PHYS/B M E/H ONCOL/ PHYSICS 501, MED PHYS/B M E 573, and MED PHYS 510.

Admissions decisions are made by a committee of faculty with expertise spanning the research areas of the department. For additional information about the application process, detailed information on required application materials, information on application fee waivers, and frequently asked questions, please refer to this webpage (https://medphysics.wisc.edu/qraduate-program/admissions/#faq).

APPLICATION CHECKLIST

- Three letters of recommendation (https://grad.wisc.edu/apply/#FAQ):
 These letters are required from teachers, scientists, or supervisors
 who can attest to the applicant's ability to be successful in graduate
 work. Letter writers should submit their letters electronically by the
 department's deadline.
- Statement of Purpose: In a statement not to exceed two pages, applicants should explain why they want to pursue graduate study in Medical Physics at the University of Wisconsin-Madison. Applicants should discuss career goals, and their preparation for graduate study, including relevant coursework, related employment, publications, presentations, awards, and honors.
- CV or resume: Upload your resume in your application. Please include any awards, scholarships, research experience, publications, and volunteer work.
- Academic transcript: Upload one copy of your transcript of all undergraduate and previous graduate work in your application.

Unofficial copies of transcripts will be accepted for review. Official copies are required if an applicant is recommended for admission.

- Applicant data: Upload your completed Applicant Data Sheet (https://medphysics.wisc.edu/graduate-program/admissions/application/#applicant-data-sheet) to the application.
- Optional: Upload a document explaining how your background and life experiences, including cultural, geographical, financial, educational, or other opportunities or challenges motivated your decision to pursue a career in Medical Physics. This is separate from the statement of purpose.
- Submit the online Graduate School Application for Admission (https://grad.wisc.edu/apply/) and pay the application fee.
- English proficiency: Please see the Graduate School requirements (https://grad.wisc.edu/apply/requirements/) for specific information.

Questions

Contact the Graduate Program Coordinator at admissions@medphysics.wisc.edu (https://guide.wisc.edu/programadmin/1359/admissions@medphysics.wisc.edu)

FUNDING

FUNDING GRADUATE SCHOOL RESOURCES

The Bursar's Office provides information about tuition and fees associated with being a graduate student. Resources to help you afford graduate study might include assistantships, fellowships, traineeships, and financial aid. Further funding information is available from the Graduate School. Be sure to check with your program for individual policies and restrictions related to funding.

PROGRAM RESOURCES

The department typically supports students enrolled in the medical physics PhD program through department or university fellowships, research or teaching assistantships, or NIH training grant appointments. All awards include a comprehensive health insurance program and remission of tuition. The student is responsible for segregated fees.

REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum degree requirements (https://guide.wisc.edu/graduate/#requirementstext) and policies (https://guide.wisc.edu/graduate/#policiestext), in addition to the program requirements listed below.

MAJOR REQUIREMENTS MODE OF INSTRUCTION

Face to Face	Evening/ Weekend	Online	Hybrid	Accelerated
Yes	No	No	No	No

Mode of Instruction Definitions

Accelerated: Accelerated programs are offered at a fast pace that condenses the time to completion. Students typically take enough credits aimed at completing the program in a year or two.

Evening/Weekend: Courses meet on the UW–Madison campus only in evenings and/or on weekends to accommodate typical business schedules. Students have the advantages of face–to–face courses with the flexibility to keep work and other life commitments.

Face-to-Face: Courses typically meet during weekdays on the UW-Madison Campus.

Hybrid: These programs combine face-to-face and online learning formats. Contact the program for more specific information.

Online: These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online format.

CURRICULAR REQUIREMENTS

CURRICULAR REQUIREMENTS			
Requirement	Detail		
Minimum Credit Requirement	54 credits		
Minimum Residence Credit Requirement	32 credits		
Minimum Graduate Coursework Requirement	32 credits must be graduate-level coursework. Refer to the Graduate School: Minimum Graduate Coursework (50%) Requirement policy: https://policy.wisc.edu/library/UW-1244 (https://policy.wisc.edu/library/UW-1244/).		
Overall Graduate GPA Requirement	3.00 GPA required. Refer to the Graduate School: Grade Point Average (GPA) Requirement policy: https://policy.wisc.edu/library/ UW-1203 (https://policy.wisc.edu/library/UW-1203/).		
Other Grade Requirements	n/a		
Assessments and Examinations	Candidates are expected to take the Oral Qualifying Examination by the end of the fourth semester of study, and to take the PhD Preliminary Examination by the end of the third year of study. Permission of the Department Chair is required if the PhD Preliminary Examination must be taken after the end of the third year. Defense of a dissertation is required within five years of successful completion of the PhD Preliminary Examination.		
Language Requirements	No language requirements.		
Graduate School Breadth Requirement	A doctoral minor or graduate/professional certificate is not required for students in the Medical Physics Graduate Program as graduate students enroll in sufficient breadth courses. However, a student can complete a minor or certificate offered by another graduate program at UW-Madison, if desired and with the approval of their		

advisor. Please see the Medical Physics Graduate Student Handbook (https://www.medphysics.wisc.edu/wp/ graduate-program (https://www.medphysics.wisc.edu/wp/

graduate-program/)/) for more information.

REQUIRED COURSES

Code	Title	Credits
Foundational		
MED PHYS/ B M E/H ONCOL/ PHYSICS 501	Radiation Physics and Dosimetry ¹	3
MED PHYS/ B M E 573	Mathematical Methods in Medical Physics ¹	3
MED PHYS 510	Fundamentals of Cellular, Molecular, and Radiation Biology ¹	3
MED PHYS 701	Ethics and the responsible conduct of research and practice of Medical Physics ¹	1
Seminar		
Students must comp credit each.	lete four semesters of seminar for 1	4
MED PHYS 900	Journal Club and Seminar	
Selected Pathway		
	Clinical or Interdisciplinary e appropriate table below for course	25-26
Research		
Students must comp satisfy the minimum	lete sufficient research credits to credit requirement.	14-15
MED PHYS 990	Research	
Total Credits		54

Clinical Pathway²

This pathway is for students who may want to enter a medical physics residency program and obtain board certification following graduate study. Students complete all foundational coursework, clinical pathway coursework, and research credits. This pathway is Commission on Accreditation of Medical Physics Education Programs (CAMPEP) accredited.1

Code	Title	Credits
Basic Coursework		
MED PHYS/ B M E 566	Physics of Radiotherapy ¹	3
MED PHYS/ B M E 578	Non-Ionizing Diagnostic Imaging ¹	4
MED PHYS/ B M E 580	The Physics of Medical Imaging with Ionizing Radiation ¹	4
MED PHYS 581	Laboratory for Medical Imaging with Ionizing Radiation	1
MED PHYS/N E 569	Health Physics and Biological Effects ¹	3
MED PHYS 671	Selected Topics in Medical Physics (Topic: Anatomy and Physiology) ¹	2
Advanced Coursew	ork	
MED PHYS courses no	umbered 600 and above	
In consultation with advisor/committee, students select 6 credits of MED PHYS courses numbered 600 and above.		6
Courses numbered 600 and above		

In consultation with advisor/committee, students select 3 3 credits of courses numbered 600 and above.

Total Credits 26

- Required for Commission on Accreditation of Medical Physics Education Programs (CAMPEP) Accreditation.
- ² These pathways are internal to the program and represent different curricular paths a student can follow to earn this degree. Pathway names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

Interdisciplinary Pathway²

This pathway requires a majority of coursework to be completed in Medical Physics, but gives students the freedom to draw coursework from other departments to develop a curriculum tailored to their research area. Students pursuing non-clinical careers in academia, research, industry, business, or government may choose this pathway. Students complete all foundational coursework, interdisciplinary pathway coursework, and research credits. This pathway is not Commission on Accreditation of Medical Physics Education Programs (CAMPEP) accredited.

Code	Title	Credits
Elective Med	lical Physics Courses	
	n with advisor/committee, students select at s of coursework in MED PHYS.	10
Elective Gra	duate Courses	
least 15 credits	n with advisor/committee, students select at s of graduate-level coursework focused on , at the 500 level or above. This may include D PHYS.	15
Total Credits	;	25

² These pathways are internal to the program and represent different curricular paths a student can follow to earn this degree. Pathway names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

POLICIES

GRADUATE SCHOOL POLICIES

The Graduate School's Academic Policies and Procedures (https:// grad.wisc.edu/acadpolicy/) serve as the official document of record for Graduate School academic and administrative policies and procedures and are updated continuously. Note some policies redirect to entries in the official UW-Madison Policy Library (https://policy.wisc.edu/). Programs may set more stringent policies than the Graduate School. Policies set by the academic degree program can be found below.

MAJOR-SPECIFIC POLICIES PRIOR COURSEWORK

Graduate Credits Earned at Other Institutions

Refer to the Graduate School: Transfer Credits for Prior Coursework (https://policy.wisc.edu/library/UW-1216/) policy.

Undergraduate Credits Earned at Other Institutions or UW-Madison

Refer to the Graduate School: Transfer Credits for Prior Coursework (https://policy.wisc.edu/library/UW-1216/) policy.

Credits Earned as a Professional Student at UW-Madison (Law, Medicine, Pharmacy, and Veterinary careers)

Refer to the Graduate School: Transfer Credits for Prior Coursework (https://policy.wisc.edu/library/UW-1216/) policy.

Credits Earned as a University Special Student at UW– Madison

Refer to the Graduate School: Transfer Credits for Prior Coursework (https://policy.wisc.edu/library/UW-1216/) policy.

PROBATION

For a graduate student in the Medical Physics Department who is a research assistant, fellow or trainee to be making satisfactory progress, they must:

- Obtain at least a 3.0 GPA in the most recent semester. Grades
 in all research courses and courses with grades of P, F, S or U are
 excluded from the average. A student who fails to make satisfactory
 progress will be dropped from the department. In exceptional cases,
 the chairperson may grant permission to continue for a specified
 probationary period.
- Maintain a minimum cumulative GPA of 3.0 for all courses taken while in the Medical Physics program and for all Department of Medical Physics courses. All research courses and all courses with grades of P, F, S or U are excluded from the average.
- 3. Have taken the qualifier examination by the end of the 2nd year of study. If a pass is not obtained on the first attempt, the second (and last) attempt to pass the qualifier examination must be made at one of the offered times within the next 6 months.

Any student, who fails to meet the requirements of 1-3 above, will be placed on probation. Failure in the first semester of probation to obtain a 3.0 average for the semester and a cumulative GPA of at least 3.0 will result in termination unless the student's advisor requests and the department and the Graduate School approves, continued enrollment. The particular courses which count toward the GPA in any probation semester must be approved in writing by the student's advisor and the Medical Physics Graduate Committee Chairman in order for the work to count toward returning the student to good standing.

ADVISOR / COMMITTEE

Candidates must acquire a major professor/advisor by the beginning of the second semester of study.

CREDITS PER TERM ALLOWED

15 credit maximum. Refer to the Graduate School: Maximum Credit Loads and Overload Requests (https://policy.wisc.edu/library/UW-1228/) policy.

TIME LIMITS

The oral PhD qualifying examination should be taken by the end of the 4th semester, and the PhD preliminary examination should be taken by the end of the third year of study. Permission of the graduate committee is required if the PhD preliminary examination must be taken after the end of the third year. Defense of a dissertation is required within five years of successful completion of the PhD preliminary examination.

Refer to the Graduate School: Time Limits (https://policy.wisc.edu/library/UW-1221/) policy.

GRIEVANCES AND APPEALS

These resources may be helpful in addressing your concerns:

- Bias or Hate Reporting (https://doso.students.wisc.edu/bias-or-hate-reporting/)
- Graduate Assistantship Policies and Procedures (https://hr.wisc.edu/policies/gapp/#grievance-procedure)
- Hostile and Intimidating Behavior Policies and Procedures (https:// hr.wisc.edu/hib/)
 - Office of the Provost for Faculty and Staff Affairs (https://facstaff.provost.wisc.edu/)
- Employee Assistance (http://www.eao.wisc.edu/) (for personal counseling and workplace consultation around communication and conflict involving graduate assistants and other employees, postdoctoral students, faculty and staff)
- Employee Disability Resource Office (https:// employeedisabilities.wisc.edu/) (for qualified employees or applicants with disabilities to have equal employment opportunities)
- Graduate School (https://grad.wisc.edu/) (for informal advice at any level of review and for official appeals of program/departmental or school/college grievance decisions)
- Office of Compliance (https://compliance.wisc.edu/) (for class harassment and discrimination, including sexual harassment and sexual violence)
- Office Student Assistance and Support (OSAS) (https://osas.wisc.edu/) (for all students to seek grievance assistance and support)
- Office of Student Conduct and Community Standards (https://conduct.students.wisc.edu/) (for conflicts involving students)
- Ombuds Office for Faculty and Staff (http://www.ombuds.wisc.edu/) (for employed graduate students and post-docs, as well as faculty and staff)
- Title IX (https://compliance.wisc.edu/titleix/) (for concerns about discrimination)

Grievance Policy for Graduate Programs in the School of Medicine and Public Health

Any student in a School of Medicine and Public Health graduate program who feels that they have been treated unfairly in regards to educational decisions and/or outcomes or issues specific to the graduate program, including academic standing, progress to degree, professional activities, appropriate advising, and a program's community standards by a faculty member, staff member, postdoc, or student has the right to complain about the treatment and to receive a prompt hearing of the grievance following these grievance procedures. Any student who discusses, inquiries about, or participates in the grievance procedure may do so openly and shall not be subject to intimidation, discipline, or retaliation because of such activity. Each program's grievance advisor is listed on the "Research" tab of the SMPH intranet (https://intranet.med.wisc.edu/).

Exclusions

This policy does not apply to employment-related issues for Graduate Assistants in TA, PA and/or RA appointments. Graduate Assistants will utilize the Graduate Assistantship Policies and Procedures (https://hr.wisc.edu/policies/gapp/) (GAPP) grievance process to resolve employment-related issues.

This policy does not apply to instances when a graduate student wishes to report research misconduct. For such reports refer to the UW-Madison Policy for Reporting Research Misconduct for Graduate Students and Postdoctoral Research Associates (https://research.wisc.edu/kb-article/?id=84924).

Requirements for Programs

The School of Medicine and Public Health Office of Basic Research, Biotechnology and Graduate Studies requires that each graduate program designate a grievance advisor, who should be a tenured faculty member, and will request the name of the grievance advisor annually. The program director will serve as the alternate grievance advisor in the event that the grievance advisor is named in the grievance. The program must notify students of the grievance advisor, including posting the grievance advisor's name on the program's Guide page and handbook.

The grievance advisor or program director may be approached for possible grievances of all types. They will spearhead the grievance response process described below for issues specific to the graduate program, including but not limited to academic standing, progress to degree, professional activities, appropriate advising, and a program's community standards. They will ensure students are advised on reporting procedures for other types of possible grievances and are supported throughout the reporting process. Resources (https://grad.wisc.edu/current-students/#reporting-incidents) on identifying and reporting other issues have been compiled by the Graduate School.

Procedures

- The student is advised to initiate a written record containing dates, times, persons, and description of activities, and to update this record while completing the procedures described below.
- If the student is comfortable doing so, efforts should be made to resolve complaints informally between individuals before pursuing a formal grievance.
- 3. Should a satisfactory resolution not be achieved, the student should contact the program's grievance advisor or program director to discuss the complaint. The student may approach the grievance advisor or program director alone or with a UW-Madison faculty or staff member. The grievance advisor or program director should keep a record of contacts with regards to possible grievances. The first attempt is to help the student informally address the complaint prior to pursuing a formal grievance. The student is also encouraged to talk with their faculty advisor regarding concerns or difficulties.
- 4. If the issue is not resolved to the student's satisfaction, the student may submit a formal grievance to the grievance advisor or program director in writing, within 60 calendar days from the date the grievant first became aware of, or should have become aware of with the exercise of reasonable diligence, the cause of the grievance. To the fullest extent possible, a grievance shall contain a clear and concise statement of the grievance and indicate the issue(s) involved, the relief sought, the date(s) the incident or violation took place, and any specific policy involved.
- 5. On receipt of a written grievance, the following steps will occur. The final step must be completed within 30 business days from the date the grievance was received. The program must store documentation of the grievance for seven years. Significant grievances that set a precedent may be stored indefinitely.
 - a. The grievance advisor or program director will convene a faculty committee composed of at least three

- members to manage the grievance. Any faculty member involved in the grievance or who feels that they cannot be impartial may not participate in the committee. Committee composition should reflect diverse viewpoints within the program.
- b. The faculty committee, through the grievance advisor or program director, will obtain a written response from the person or persons toward whom the grievance is directed. The grievance advisor or program director will inform this person that their response will be shared with the student filing the grievance.
- c. The grievance advisor or program director will share the response with the student filing the grievance.
- d. The faculty committee will make a decision regarding the grievance. The committee's review shall be fair, impartial, and timely. The grievance advisor or program director will report on the action taken by the committee in writing to both the student and the person toward whom the grievance was directed.
- 6. If either party (the student or the person or persons toward whom the grievance is directed) is unsatisfied with the decision of the program's faculty committee, the party may file a written appeal to the SMPH senior associate dean for basic research, biotechnology and graduate studies within 10 business days from the date of notification of the program's faculty committee. The following steps will occur:
 - a. The grievant will be notified in writing, within 5 business days of the written appeal, acknowledging receipt of the formal appeal and establishing a timeline for the review to be completed.
 - b. The senior associate dean or their designee may request additional materials and/or arrange meetings with the grievant and/or others. If meetings occur, the senior associate dean or their designee will meet with both the grievant and the person or persons toward whom the grievance is directed.
 - c. The senior associate dean or their designee will assemble an ad hoc committee of faculty from outside of the student's graduate program and ask them to prepare a written recommendation on whether to uphold or reverse the decision of the program on the student's initial grievance. The committee may request additional materials and/or arrange meetings with the grievant and/or others. If meetings occur, the committee will meet with both the grievant and the person or persons toward whom the grievance is directed.
 - d. The senior associate dean or their designee will make a final decision within 20 business days of receipt of the committee's recommendation.
 - e. The SMPH Office of Basic Research, Biotechnology, and Graduate Studies must store documentation of the grievance for seven years. Grievances that set a precedent may be stored indefinitely.
- 7. The student may file an appeal of the School of Medicine and Public Health decision with the Graduate School. See the Grievances and Appeals section of the Graduate School's Academic Policies and Procedures (https://grad.wisc.edu/documents/grievances-and-appeals/).

Time Limits

Steps in the grievance procedures must be initiated and completed within the designated time periods except when modified by mutual consent. If the student fails to initiate the next step in the grievance procedure within the designated time period, the grievance will be considered resolved by the decision at the last completed step.

OTHER

Most students are funded with research assistantships through the research programs of their advisors. A limited number of traineeships are available to advanced students in the UW Radiological Sciences Training Program for career training in cancer research. Other fellowships are also available to qualified students (e.g., AAPM, Cardiovascular and Neurological Sciences Training Programs, Advanced Opportunity Fellowship Program).

PROFESSIONAL DEVELOPMENT

PROFESSIONAL DEVELOPMENT GRADUATE SCHOOL RESOURCES

Take advantage of the Graduate School's professional development resources (https://grad.wisc.edu/pd/) to build skills, thrive academically, and launch your career.

LEARNING OUTCOMES

LEARNING OUTCOMES

- 1. Articulates research problems, potentials, and limits with respect to theory, knowledge, or practice within the field of medical physics.
- Formulates ideas, concepts, designs, and/or techniques beyond the current boundaries of knowledge within the field of medical physics.
- 3. Creates research, scholarship, or performance that makes a substantive scientific contribution.
- 4. Demonstrates breadth and depth within their learning experiences.
- Advances contributions of the field of medical physics to society through peer-reviewed journal publications.
- 6. Communicates complex ideas in a clear and understandable manner in both oral and written formats.
- 7. Demonstrates ethical research and professional conduct.

ACCREDITATION

ACCREDITATION

Commission on Accreditation of Medical Physics Education Programs (http://www.campep.org)

Accreditation status: Accredited through December 31, 2026. Next accreditation review: Spring 2026.

CAMPEP Compliant Degree Requirements

Students must complete the courses indicated in the core and clinical pathway flagged with footnote 1 (p. 2) to receive the letter of attestation from the Department of Medical Physics, per CAMPEP guidelines (https://www.campep.org/default.asp).