Health Physics

Health Physics

Degree Offered: M.S.
Program Director: Norman E. Bolus, MSPH, MPH
Phone: (205) 934-3427
E-Mail: bolusn@uab.edu
Website: www.uab.edu/shp/cds

Program Information
Health Physics is a discipline that focuses on the application of physics, nuclear science, and engineering physics to diagnostics, treatment, and therapeutic processes pertaining to public health protection. It includes instruction in radiation biophysics, biophysics, health effects of natural and artificially induced radiation, hazard evaluation, environmental radioactivity, nuclear physics, engineering physics, radiobiology, medical radiology, calibration and dosage theory, computer application and medical informatics, and specific research problems involving the use of non-ionizing and ionizing radiation.

Admission Requirements
In addition to the general Graduate School admission requirements, applicants to the M.S. program must:

- Have a baccalaureate degree in biology, physics, chemistry, biomedical sciences, bioengineering, or a related degree from an accredited college or university,
- Have a minimum undergraduate GPA of 3.0 (A= 4.0), computed from all undergraduate credits or from the last 60 semester hours of undergraduate course credit,
- Apply for admission to the UAB MHP Program,
- International students from non-English speaking countries are required to submit English proficiency scores (TOEFL/IELTS/ PTEA/Duolingo) that meet the Graduate School’s minimum score requirements: TOEFL - 80; IELTS - 6.5; PTEA: - 53; IELA - 176 - Duolingo - 120.

The completed application must be on file with the program office by February 15th for a priority interview to be granted. All eligible applicants will be interviewed in March for admission decisions in early April. Eligible late applicants will be considered on a space-available basis up to August 1st.

If accepted, students must complete the UAB medical history questionnaire and physical, provide proof of required immunizations, and receive satisfactory screening by the UAB Medical Center Student Health Service before enrollment. A background check and drug screen will be required at program admission and prior to clinical placement.

Persons with a baccalaureate degree may be eligible to register for courses as non-degree seeking graduate students before acceptance into the M.S. program. If a non-degree seeking graduate student meets the M.S. program admission requirements, up to 12 semester hours of approved non-degree graduate coursework may be accepted for the M.S. degree. Admission of a student to any course as a non-degree student does not constitute admission to the M.S. degree program.

Early Acceptance
Early Acceptance Programs are designed for academically superior high-school students. Early Acceptance Programs allow high achieving students to be admitted to the Health Physics program at the same time they are admitted to an undergraduate program.

Eligible students are required to maintain a 3.5 undergraduate GPA and complete the following pre-requisite courses: PH 201, PH 202, MA 125 or PH 221 and PH 222

Program Accreditation and Professional Credentials
Established Health Physics programs may seek accreditation from the American Board of Health Physics (ABHP).

Additional Information

Entry Term: Fall Semester
Deadline for Application Materials to be in the Graduate School Office: First Consideration: February 15th; Space available basis after first consideration, up to August 1.

Entrance Tests: For international applicants from non-English speaking countries, minimum score requirements: TOEFL - 80; IELTS - 6.5; PTEA: - 53; IELA - 176 - Duolingo - 120.

Contact Information
For detailed information, contact the Department of Clinical and Diagnostic Sciences, Health Physics Program, UAB School of Health Professions, SHPB 446, 1716 9th Avenue South, Birmingham, Alabama 35294-1212.
Telephone 205-934-3209.
E-mail AskCDS@uab.edu

Master of Science in Health Physics

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<th>Requirements</th>
<th>Hours</th>
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<tr>
<td>CDS 505</td>
<td>Professional Skills Development</td>
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<tr>
<td>CDS 610</td>
<td>Research Design and Statistics</td>
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<tr>
<td>NMT 610</td>
<td>Medical Radiation Physics</td>
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<tr>
<td>NMT 621</td>
<td>Nuclear Medicine Instrumentation I</td>
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<tr>
<td>NMT 641</td>
<td>Regulations, Radiation Protection/Biology and Lab</td>
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<tr>
<td>MHP 601</td>
<td>Principles of Health Physics</td>
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<tr>
<td>MHP 611</td>
<td>Physics of Diagnostic Imaging</td>
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<tr>
<td>MHP 620</td>
<td>Principles of Dosimetry</td>
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<td>MHP 621</td>
<td>Nonionizing Radiation</td>
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<td>MHP 653</td>
<td>Research Methodology and Publication Analysis</td>
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<tr>
<td>Supervised Practice</td>
<td>Summer, Second Fall 6 Semester Hours each: Total 12 hours</td>
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<td>MHP 691</td>
<td>Supervised Practice</td>
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<tr>
<td>MHP 698</td>
<td>Non-Thesis Research</td>
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Electives Substitution of elective courses must be approved by advisor 6

MHP 651 | Advanced Radiation Biology |
Courses

MHP 601. Principles of Health Physics. 3 Hours.
Introduction to the practice of health physics. Topics include accelerator and cyclotron health physics, environmental radiation, emergency response, decommissioning and decontamination, and nuclear reactors.

MHP 611. Physics of Diagnostic Imaging. 3 Hours.
Overview of the various imaging modalities used in a clinical setting. Topics include the basics of X-rays, ultrasound, CT, MRI, SPECT & PET imaging.
Prerequisites: NMT 610 [Min Grade: C]

MHP 620. Principles of Dosimetry. 3 Hours.
Fundamental principles of radiation dosimetry. Topics include the mathematical treatment of internal and external doses from radiation sources, dosimetry models, routes of intake, industrial and medical sources.
Prerequisites: MHP 601 [Min Grade: C]

MHP 621. Nonionizing Radiation. 3 Hours.
Recognition, assessment, and control of nonionizing radiation hazards. Topics include sound, electricity, magnetism, microwaves, visible light, ultraviolet radiation, and lasers.
Prerequisites: MHP 611 [Min Grade: C] and NMT 610 [Min Grade: C]

MHP 651. Advanced Radiation Biology. 3 Hours.
Effects of radiation at the molecular, cellular and whole-tissue level. Topics include cell survival curves, repair of radiation damage, radiation carcinogenesis, risk assessment models, cancer biology, model tumor systems, and dose fractionation in radiotherapy.
Prerequisites: NMT 641 [Min Grade: C]

MHP 652. Radiochemistry. 3 Hours.
Overview of fundamentals of radiochemistry and experiments including counting statistics, radionuclide generator design, elution and operation, labeling and quality control, liquid scintillation counting, radiotracer techniques and applications, and dating techniques.
Prerequisites: MHP 611 [Min Grade: C] and NMT 610 [Min Grade: C]

MHP 653. Research Methodology and Publication Analysis. 3 Hours.
Perform scientific research, critically evaluate scientific literature, and write an abstract and scientific poster on a topic relevant to health physics.
Prerequisites: CDS 610 [Min Grade: C]

MHP 675. Special Topics in Health Physics. 1-4 Hour.
Exploration of current issues in Health Physics.

MHP 691. Supervised Practice. 6 Hours.
Supervised practical experiences in applied health physics.
Prerequisites: MHP 620 [Min Grade: C]

Directed research with a faculty mentor to complete an applied master's degree project.

MHP 699. Thesis Research for MHP. 1-6 Hour.
Original research in health physics and interpretation of results. Demonstrates student's acquaintance with literature of field and competency in proper selection and execution of research methodology.