Nuclear Medicine Technology

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

Program Information
Program Mission
The UAB Nuclear Medicine Technology Program is dedicated to providing a quality program by offering didactic and clinical coursework in a curriculum that is designed to prepare students to become competent and productive entry level technologists. The program also serves the profession through its offering of continuing education activities and educational products.

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

- Have any baccalaureate degree in biology, physics, chemistry, biomedical sciences, bioengineering, or a related degree from an accredited college or university, along with pre-requisite course requirements,
- 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 NMT Program,
- Complete a clinical observation and write a reflection on the observation,
- 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. See other international admission requirements at https://www.uab.edu/graduate/admissions/international-applicants/requirements.

The completed application and observation form 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 Master of Science in Nuclear Medicine Technology 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: MA 106, CH 105-CH 108 or CH 115-CH 118, BY 216 or NMT 320, BY 115, BY 116, MA 180, PH 201, PH 202, HCM 350, HCM 330, CDS 425

Essential Functions
Essential functions are physical abilities, mental abilities, skills, attitudes, and behaviors the students must show evidence of to be able perform at each stage of their didactic and clinical education. A list of essential functions is on file in the NMT Program Office and in the NMT Student Handbook.

If you have a disability, but have not contacted Disability Support Services (DSS), please call (205) 934-4205 (voice) or (205) 934-4248 (TDD), or visit the DSS offices at 1701 9th Avenue South. Additional information is available at http://www.uab.edu/students/disability/.

Accreditation and Certification
Nuclear Medicine Technology academic programs are accredited by the Joint Review Committee on Nuclear Medicine Technology Programs (JRCNMT). Program graduates are eligible to apply for the certification examination offered by both the Nuclear Medicine Technology Certification Board (NMTCB) or the American Registry of Radiological Technologists (ARRT).

JRCNMT
2000 W. Danforth Road
Suite 130, #203
Edmond, OK 73003
Phone: 405.285.0546
Fax: 405.285.0579
jrcnmt@coxinet.net
http://www.jrcnmt.org/

NMTCB
3558 Habersham at Northlake
Building I
Tucker, GA 30084
Phone: 404.315.1739
Fax: 404.315.6502
board@nmtcb.org
Additional Information

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<thead>
<tr>
<th>Entry Term:</th>
<th>Fall Semester</th>
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<tr>
<td>Deadline for All Application</td>
<td>First Consideration: February 15th;</td>
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<td>Materials to be in the Graduate School Office:</td>
<td>Space available basis after first</td>
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<td>consideration, up to August 1st</td>
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<td>Entrance Tests:</td>
<td>For international applicants from</td>
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<td>non-English speaking countries,</td>
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<td>minimum score requirements:</td>
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<td>Comments:</td>
<td>Scholarship money is available, but</td>
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<td>is very limited; transcript evaluation</td>
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<td>by WES is required for applicants</td>
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<td>with foreign university degrees</td>
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Contact Information

For detailed information, contact the Department of Clinical and Diagnostic Sciences, Nuclear Medicine Technology 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 Nuclear Medicine Technology

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<tr>
<th>Requirements</th>
<th>Hours</th>
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<tr>
<td>CDS 505 Professional Skills Development</td>
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<tr>
<td>CDS 610 Research Design and Statistics</td>
<td>3</td>
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<tr>
<td>NMT 602 Introduction to Nuclear Medicine, Patient Care &amp; Communication Skills</td>
<td>3</td>
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<tr>
<td>NMT 610 Medical Radiation Physics</td>
<td>4</td>
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<tr>
<td>NMT 621 Nuclear Medicine Instrumentation I</td>
<td>4</td>
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<tr>
<td>NMT 631 Nuclear Medicine Anatomy &amp; Physiology I</td>
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<tr>
<td>NMT 632 Nuclear Medicine Anatomy &amp; Physiology II</td>
<td>4</td>
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<tr>
<td>NMT 641 Regulations, Radiation Protection/Biology and Lab</td>
<td>4</td>
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<tr>
<td>NMT 653 Research Methodology and Publication Analysis</td>
<td>3</td>
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<tr>
<td>Clinical Practice</td>
<td>15</td>
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<tr>
<td>NMT 691 NMT Clinical Practice</td>
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<td>HA 650 Management and Leadership Skills for Clinical Professionals</td>
<td>3</td>
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<tr>
<td>NMT 605 Cross-Sectional Anatomy</td>
<td>3</td>
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<tr>
<td>NMT 622 NMT Instrumentation II</td>
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<tr>
<td>NMT 623 CT Instrumentation</td>
<td>3</td>
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<tr>
<td>NMT 660 Radiopharmacy, Pharmacology &amp; Lab</td>
<td>3</td>
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NMT 698 Non-Thesis Research 4

Total Hours 64

1 Varies by term 3, 5, 7 (Spring, Summer, 2nd Fall)

Courses

NMT 525. First Aid and Healthcare Provider CPR and AED. 1 Hour. Knowledge and skills needed to perform basic first aid and CPR procedures for adult, child and infant victims according to the American Heart Association (AHA) Standards.

NMT 540. Physics in Biomedical Sciences. 3 Hours. Physical concepts used in biology, human anatomy, physiology, as well as in medical diagnosis and treatment. Topics include mechanics, fluids, waves, heat, sound, optics, electricity & magnetism. Advanced topics include radiation, X-rays, MRI, and nuclear medicine.

NMT 601. Introduction to MRI Clinic. 2 Hours. Overview of patient management, MRI screening and safety procedures, quality assurance procedures and FDA guidelines.

NMT 602. Introduction to Nuclear Medicine, Patient Care & Communication Skills. 3 Hours. Overview of professional organizations and nuclear medicine; hospital organization; medical terminology; medical records; communication skills, health law and medical ethics; basic patient care theory.

NMT 605. Cross-Sectional Anatomy. 3 Hours. Integration of the knowledge of gross anatomy with the identification and location of structures in cross-sectional images. Computed Tomography (CT) and Magnetic Resonance (MR).

NMT 610. Medical Radiation Physics. 4 Hours. Overview of basic medical radiation physics concepts and experiments.

NMT 621. Nuclear Medicine Instrumentation I. 4 Hours. Theory and experiments on radiation detection instrumentation; calibration; maintenance standards; practical uses of gaseous detectors, scintillation detectors, and multichannel analyzers; quality assurance testing for nuclear medicine instrumentation including GM detectors, ionization chambers and scintillation detectors.

NMT 622. NMT Instrumentation II. 3 Hours. Applies computer fundamentals to the acquisition and processing of nuclear medicine patient data. Quality control of SPECT and PET camera systems.

Prerequisites: NMT 621 [Min Grade: C]

NMT 623. CT Instrumentation. 3 Hours. Theoretical principles of Computed Tomography (CT); CT instrumentation, data acquisition, data processing, and image quality.

Prerequisites: NMT 605 [Min Grade: C]

NMT 624. Physics/Instrumentation of Nuclear Magnetic Resonance. 3 Hours. Fundamental physical principles of nuclear magnetic resonance, including structure of atom, concept of resonance, Larmor frequency, gyromagnetic ratio, T1 and T2 and methods of generating magnetic fields.

NMT 631. Nuclear Medicine Anatomy & Physiology - Procedures I. 4 Hours. Study of the utilization of nuclear medicine procedures including skeletal, respiratory, endocrine, gastrointestinal and genitourinary systems. Anatomy and relevant concepts in physiology are reviewed and applied to each procedure.

Prerequisites: NMT 601 [Min Grade: C]
NMT 632. Nuclear Medicine Anatomy & Physiology - Procedures II. 4 Hours.
Study of the utilization of nuclear medicine procedures including nuclear cardiology, oncology, central nervous and hematopoietic systems and applications of position emission tomography. Anatomy and relevant concepts in physiology are reviewed and applied to each procedure.
Prerequisites: NMT 631 [Min Grade: C]

NMT 633. Computed Tomography Procedures. 3 Hours.
Overview of CT positioning criteria, specific selections, and options in protocols. Understanding concepts in advanced CT including interventionl imaging, positron emission tomography and special procedures.
Prerequisites: NMT 623 [Min Grade: C]

NMT 634. MRI Scanning and Sequence. 3 Hours.
Overview of basic MRI theory; imaging sequences, parameter optimizations, and imaging procedures, flow imaging, and MR spectroscopy.
Prerequisites: NMT 624 [Min Grade: C]

NMT 641. Regulations, Radiation Protection/Biology and Lab. 4 Hours.
Overview of principles and methods of radiation protection, radiation biology and ionizing radiation regulations.

NMT 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 nuclear medicine technology.
Prerequisites: CDS 610 [Min Grade: C]

NMT 660. Radiopharmacy, Pharmacology & Lab. 3 Hours.
Overview of fundamentals of radiopharmacy and experiments including radionuclide generator design, elution and operation, labeling and quality control of Tc-99m labeled compounds, unit dose preparation; radiopharmaceutical design, IND process, MIRD, contrast media and pharmacology.
Prerequisites: NMT 610 [Min Grade: C]

NMT 675. Special Topics in Nuclear Medicine Technology. 1-4 Hour.
Faculty-led exploration of current topics and issues in nuclear medicine technology.

NMT 691. NMT Clinical Practice. 3-7 Hours.
Directed clinical practice: in vivo procedures; instrumentation quality control; radiopharmacy; applied radiation safety procedures.

NMT 694. Computed Tomography Clinical Practice. 10 Hours.
Directed clinical practice: CT instrumentation quality control; applied application of CT procedures.
Prerequisites: NMT 605 [Min Grade: C] and NMT 623 [Min Grade: C] and NMT 633 [Min Grade: C]

NMT 695. MRI Clinical Practice. 10 Hours.
Directed clinical practice: MRI instrumentation quality control; applied application of MRI procedures.
Prerequisites: NMT 602 [Min Grade: C] and NMT 605 [Min Grade: C] and NMT 624 [Min Grade: C] and NMT 634 [Min Grade: C]

Directed research for a non-thesis master of science degree project.

NMT 699. Thesis Research. 1-6 Hour.
Original research in nuclear medicine technology and interpretation of results. Demonstrates student's acquaintance with literature of field and competency in proper selection and execution of research methodology.
Prerequisites: GAC M