# NMT-Nuclear Medicine Technology

**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 603. Patient Care and Safety in MRI. 2 Hours.**
Topics related to general patient care in radiographic imaging settings (e.g. patient communication/education, infection control, contrast administration and legal/ethical considerations) with an emphasis on the MRI environment in terms of patient safety/education and contrast media.

**NMT 604. Introduction to Nuclear Medicine, Management, Patient Care & Lab. 2 Hours.**
Overview of professional organizations and nuclear medicine; hospital organization; medical terminology; medical records; introduction to other aspects of nuclear medicine technology including management, communication skills, health law and medical ethics; basic patient care theory and techniques including standard precautions, infection control, vital signs, venipuncture, patient transfer techniques, immobilization techniques, aseptic and non-aseptic techniques, oxygen administration, and medical emergencies which are required for nuclear medicine students prior to entering clinical training.

**NMT 605. Cross-Sectional Anatomy. 2 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 611. Physics of Diagnostic Imaging for Radiation Safety Officer. 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 620 [Min Grade: C]

**NMT 620. Nuclear Medicine Physics, Instrumentation, and Lab. 4 Hours.**
Principles and applications of nuclear medicine physics and instrumentation.
**Prerequisites:** MA 180 [Min Grade: C] and PH 201 [Min Grade: C] and PH 202 [Min Grade: C]

**NMT 624. Physics/Instrumentation of Nuclear Magnetic Resonance. 2 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 625. CT Physics and Instrumentation. 2 Hours.**
Provide theoretical principles of Computed Tomography (CT); CT instrumentation, physics, data, acquisition, data processing and image quality.

**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.

**NMT 632. Nuclear Medicine Anatomy & Physiology - Procedures II. 2 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. 2 Hours.**
Overview of CT positioning criteria, specific selections, and options in protocols. Understanding concepts in advanced CT including interventional imaging, positron emission tomography and special procedures.

**NMT 634. MRI Scanning and Sequence. 2 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 651. Radiation Safety Officer 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]

**NMT 653. Research Methodology and Publication Analysis. 2 Hours.**
Perform scientific research, critically evaluate scientific literature, and write an abstract and scientific poster on a topic relevant to nuclear medicine.

**NMT 660. Radiopharmacy, Pharmacology & Lab. 4 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.

**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. 3-9 Hours.**
Directed clinical practice: in vivo procedures; instrumentation quality control; radiopharmacy; applied radiation safety procedures.

**NMT 692. NMT and CT Clinical Practice. 7 Hours.**
Clinical experience providing the opportunity to observe, work, and train to become a Nuclear Medicine Technologist in a clinical setting.
**Prerequisites:** NMT 691 [Min Grade: C]

**NMT 693. Radiation Safety Officer Supervised Practice. 1-8 Hour.**
Practical experience in Radiation Safety Practices. Practical experiences that students can engage in at UAB include research labs where radioisotopes are used, radiation oncology, nuclear medicine (imaging, therapy, and radiopharmacy), the molecular imaging center, the cyclotron facility, and occupational health & safety.
**Prerequisites:** NMT 620 [Min Grade: C]

**NMT 694. Computed Tomography Clinical Practice. 1-10 Hour.**
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. 1-10 Hour.**
Directed clinical practice: MRI instrumentation quality control; applied application of MRI procedures.
**Prerequisites:** NMT 624 [Min Grade: C] and NMT 634 [Min Grade: C]

**NMT 696. Seminar and Registry Review. 2 Hours.**
Ethics, healthcare disparities and costs associated with selected disease conditions; board exam review.

**NMT 697. Journal Club in Nuclear Medicine and Molecular Imaging Sciences. 1 Hour.**
Analysis of primary scientific literature in the field of nuclear medicine and molecular imaging sciences.

**NMT 698. Non-Thesis Research. 1-10 Hour.**
Directed research for a non-thesis master of science degree project.

**NMT 699. Thesis Research. 1-10 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