NMT-Nuclear Medicine Tech Courses

Courses

NMT 304. Physics for Technologists. 8 Hours.
Mechanics, static and dynamic fluids, wave motion, heat, sound, electricity, magnetism, and light; fundamental concepts of physics with mathematical formulation to enhance problem-solving skills.
Prerequisites: MA 105 [Min Grade: C] or MA 106 [Min Grade: C]

NMT 320. Human Pathophysiology. 3 Hours.
Introduction to basic disease concepts, theories of disease causation and pathophysiologic disorders most frequently encountered in clinical practice.
Prerequisites: BY 115 [Min Grade: C] and BY 116 [Min Grade: C]

NMT 400. Intro to Clinical Nuclear Medicine Technology. 2 Hours.
Overview of professional organizations and nuclear medicine; hospital organization; medical terminology; medical records; introduction to other aspects of nuclear medicine technology including ethics concerning the hospital setting; writing assignments on professionalism and hospital ethics. Writing and Ethics and Civic Responsibility are significant components of this course.

NMT 401. Introduction to MRI Clinic. 2 Hours.
This course is designed to provide students with the practical aspect of Magnetic Resonance Imaging. The role of MRI technologists, patient management, MRI screening and safety procedures, quality assurance procedures and FDA guidelines will be discussed.
Prerequisites: NMT 424 [Min Grade: C] or NMT 417 [Min Grade: C]

NMT 404. Patient Care. 2 Hours.
Basic patient care theory and techniques including standard precautions, infection control, vital signs venipuncture patient transfer techniques, immobilization techniques, aspectic and nonaseptic techniques, oxygen adminstration, and medical emergencies which are required for nuclear medicine students prior to entering clinical training.

NMT 405. Cross-Sectional Anatomy. 3 Hours.
Integration of the knowledge of gross anatomy with the identification and location of structures in cross-sectional images. Computer Tomography (CT), Magnetic Resonance (MR), and Diagnostic Ultrasound (US) images in various anatomical planes will be used to locate and identify anatomical structures.

NMT 410. Medical Radiation Physics. 4 Hours.
Qualitative and quantitative concepts of radiation physics pertaining to medical applications in nuclear medicine, radiology, and radiation therapy; atomic and nuclear structure, radioactive decay, properties ofradiation; x-ray production; artificial production; photon interactions in matter and shielding attenuation processes.
Prerequisites: MA 105 [Min Grade: C] or MA 106 [Min Grade: C] or MA 125 [Min Grade: C] or MA 225 [Min Grade: C]

NMT 421. Instrumentation I. 3 Hours.
Theoretical and practical concepts in 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; gamma spectrometry of all commonly used nuclear medicine radionuclides. Principles of in vivo and in vitro counting and imaging using probe counters, well counters, and scintillation gamma cameras; scintillation gamma camera quality control; types of collimators used in nuclear medicine, their use and function.

NMT 421L. Instrumentation I Laboratory. 1 Hour.
Introduction to basic radiation and nuclear counting instrumentation. Utilizing proper calibration of the Multi-Channel Analyzer (MCA) and Geiger Muller (G-M) Counter. Determine the proper operating voltage, detector efficiency, window width, and amplifier gain and energy resolution of the MCA. Proper counting statistics and duel isotope counting labs will emphasize the importance of proper use of nuclear counting instrumentation.

NMT 422. Instrumentation II. 3 Hours.
Applies computer fundamentals to the acquisition and processing of nuclear medicine patient data. Quantitative planar studies as well as SPECT/PET image reconstruction, filtering, and attenuation correction are presented. Quality control of SPECT and PET camera system.
Prerequisites: NMT 421 [Min Grade: C]

NMT 423. Computed Tomography. 3 Hours.
Provide theoretical principles of Computed Tomography (CT)using the historical development of CT and the physical principles underlying CT scanning, CT Instrumentation, data acquisition, data processing and image quality.

NMT 424. Physics/Instrumentation of Nuclear Magnetic Resonance. 3 Hours.
Fundamental physical principle of nuclear magnetic resonance, including structure of atom, concept of resonance, Larmor frequency, gyromagnetic ratio, T1 and T2 and methods of generating magnetic fields; theory of operation of NMR spectrometers and imagers, including function of basic components, effects of linear gradients, signal processing, slice definition and iamge reconstruction.

NMT 425. First Aid & 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 431. Nuclear Medicine Procedures I. 4 Hours.
Study of the utilization of nuclear medicine procedures and the nuclear medicine technologist's responsibilities in completing a procedure involving the skeletal, respiratory, endocrine, gastrointestinal and genitourinary systems. Anatomy and relevant concepts in physiology are reviewed and applied to each procedure. Common pathologies demonstrated with each procedure are also discussed.
Prerequisites: BY 115 [Min Grade: C] and BY 116 [Min Grade: C]

NMT 432. Nuclear Medicine Procedures II. 4 Hours.
Instruction of various nuclear medicine procedures and the nuclear medicine technologist's responsibilities for completing a procedure involving 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. Common pathologies demonstrated with each procedure and the basics of three and twelve lead ECGs.
Prerequisites: NMT 431 [Min Grade: C]

NMT 433. Computed Tomography Procedures. 3 Hours.
Provide a solid foundation of Computed Tomography (CT) Procedures through basic CT scanning concepts and image quality, detailed discussions about CT positioning criteria, specific selections, and options in protocols. Understanding concepts in advanced CT including interventional imaging, virtual reality imaging, positron emission tomography and special procedures.
Prerequisites: NMT 405 [Min Grade: C] or RTT 402 [Min Grade: C] and NMT 423 [Min Grade: C](Can be taken Concurrently) or RTT 403 [Min Grade: C]

NMT 434. MRI Scanning and Sequence. 3 Hours.
This course will provide the students with a solid foundation of the magnetic resonance imaging (MRI) modality. Basic MRI theory will be reviewed along with detailed discussion about imaging sequences, parameter optimizations, and imaging procedures will be extensively discussed. Advanced concepts such as flow imaging, and MR spectroscopy will also be discussed.
Prerequisites: NMT 405 [Min Grade: C] and NMT 424 [Min Grade: C]

NMT 440. 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, optics, electricity & magnetism. Advanced topics include radiation, X-rays, MRI, and nuclear medicine.
Prerequisites: PH 201 [Min Grade: C] and PH 202 [Min Grade: C]

NMT 441. Radiation Protection and Biology. 3 Hours.
Principles and methods of radiation protection, health physics units, measurement, and dose limiting regulations for occupationally and non occupationally exposed individuals; radiation surveys;techniques and decontamination methods, monitoring of radioactive waste, radiation dose measurements, and radionuclide accountability; special topics, including precautions with brachytherapy patients, with patients receiving therapeutic amounts of radionuclides, and in management of accidentally contaminated individuals. Physical, chemical and biological mechanisms involved in action of different types of radiations on living celld and their components are covered. Emphasis is given to being able to interpret how to respond to a malicious radiological exposure incident in an appropriate manner.

NMT 442. Application of Radiation Protection and Biology. 1 Hour.
Introduction to basic radiation physics and radiation protection experiments, emphasizing the ALARA concept; basic concepts of radiation safety (including time, distance and appropriate shielding), half-lifes, half value layers for different absorbers and radioisotopes, the inverse square law, semi-log graphing and calibration and use of nuclear counting instrumentation; proper calibration and use of the Multi Channel Analyzer (MCA) and Geiger Muller (G-M) Counter; proper operating voltage, detector efficiency, and window width, proper counting statistics and dual isotope counting labs.

NMT 443. Regulatory Issues. 2 Hours.
Basic knowledge of appropriate rules, regulations and work practices governing the use of radioactive materials in the medical setting to plan for and participate in a successful radiation safety compliance management program.

NMT 451. Communication Skills. 1 Hour.
This course explores the nature of the patient-technologist relationships, technologist-hospital professional relationship and the role of the technologist as apatient educator. Therapeutic communication skills, interviewing skills, and the psychosocial aspects of being a patient are discussed.

NMT 452. Health Law for NMT. 1 Hour.
Introduction to medical law and ethics presenting an overview of major ethical theories and their relation to health law. Topics covered include ethical dilemmas and ethical decision making models and their application to clinical practice; legal principles and their application to healthcare; issues concerning professional liability, informed consent, and malpractice.

NMT 460. Radiochemistry and Radiopharmacy. 2 Hours.
Introduction to fundamentals of radiopharmacy including radionuclide genenrator design and operation, labeling and quality control of Tc-99m labeled compounds, unit dose preparation and a review of federal regulations pertinent to radionuclides and radiopharmaceuticals; radiopharmaceutical design, IND process and the basic concepts of internal radiation dosimetry.

NMT 461. Radiopharmacy and Pharmacology Laboratory. 1 Hour.
Utilizing the fundamentals of radiopharmacy including radionuclide generator design and operation, labeling and qulaity control of Tc-99m labeled compounds, unit dose preparation, and a review of federal regulations pertinent to radionuclides and radiopharmaceuticals along with the radiopharmaceutical design and the IND process and basic concepts of internal radiation dosimetry.

NMT 491. Clinical Practice I. 5 Hours.
Directed clinical practice: in vivo procedures; instrumentation quality control; radiopharmacy; applied radiation safety procedures.

NMT 492. Clinical Practice II. 7 Hours.
Directed clinical practice: in vivo procedures; instrumentation quality control; radiopharmacy; applied radiation safety procedures.
Prerequisites: NMT 491 [Min Grade: C]

NMT 493. Clinical Practice III. 4-10 Hours.
Directed clinical practice: in vivo procedures; instrumentation quality control; radiopharmacy; applied radiation safety procedures.
Prerequisites: NMT 492 [Min Grade: C]

NMT 494. CT Clinical Practice. 12 Hours.
Clinical application of the nuclear medicine program concepts with opportunity to observe, work, and train to become certified in CT; performance evaluated through clinical experiences, final evaluation, and a self-assessment.

NMT 495. MRI Clinical Practice. 12 Hours.
Clinical application of the nuclear medicine program concepts with opportunity to observe, work, and train to become certified in MRI; performance evaluated through clinical experiences, final evaluation, and a self-assessment.

NMT 499. Correlative Imaging. 3 Hours.
Capstone course encompassing all aspects of the nuclear medicine technology program to investigate and analyze the multifaceted nature of disease diagnosis and treatment in the United States, current trends in healthcare costs and payment methods, and healthcare disparities associated with these imaging tests This course consists of the three aspects of the University Quality Enhancement Plan including Ethics and Civic Responsibility, Writing and Quantitative Literacy.