

# Nuclear Medicine Technology Program (NMT)

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[www.uwlax.edu/academics/department/health-professions/academic-programs/nuclear-medicine-technology](http://www.uwlax.edu/academics/department/health-professions/academic-programs/nuclear-medicine-technology) (<https://www.uwlax.edu/academics/department/health-professions/academic-programs/nuclear-medicine-technology/>)

Nuclear medicine is a dynamic healthcare field that performs imaging and therapy procedures for a wide variety of diseases. It is a safe procedure that uses a very small amount of radioactive drugs, known as radiopharmaceuticals, to provide a detailed picture of what is happening inside the body. Nuclear medicine provides unique information about both structure and function of nearly every human organ. It can characterize and quantify physiologic function and identify abnormalities very early in the progress of a disease long before many medical problems are apparent with other diagnostic tests. There has been dramatic growth in the field in the last few years, and it is expected to grow exponentially in the next decade as more radiopharmaceuticals are created and technology advances. The possibility for career progression is vast within nuclear medicine, but most involve providing patient-centered care, pharmacology lab work, and operating advanced medical technology. Nuclear medicine is "the future of personalized care and precision medicine."

The nuclear medicine technology curriculum requires six semesters on campus in pre-professional and professional core courses before the clinical internship. The length, start time, and location of the clinical internship varies between all the affiliate clinical internship sites, but all of them are 12-13 months long and are completed at the internship site location, or 3 months on the UWL campus and 9 months at the internship site. When students have met all requirements of the major and the university, they are eligible for graduation and to apply to take the national exam to become a certified nuclear medicine technologist.

UWL, in cooperation with its clinical internship sites, currently provides the only baccalaureate degree program in nuclear medicine technology in the state of Wisconsin and the largest baccalaureate program in the United States. The UWL nuclear medicine technology program is designed to offer a high-quality curriculum rich in academic and clinical experiences that ensures both academic and technical competency while setting a foundation for career success and a desire for lifelong learning in their profession. During the clinical internship, students will work directly with certified nuclear medicine technologists in direct patient care in busy and highly regarded departments as well as nuclear medicine radiologists, physicists, pharmacists, and chemists. This program not only provides the knowledge, skills, and abilities to be successful in nuclear medicine but also information on how to continuously make a future career meaningful and purposeful.

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## Major

- Nuclear medicine technology - BS (<http://catalog.uwlax.edu/undergraduate/nuclearmedicinetechonology/nuclearmedicinetechonologybs/>)

## Courses

NMT 201 Cr.1

### Introduction to Nuclear Medicine Technology

Orientation to the application and professional aspects of nuclear medicine technology; including radiation safety and protection, radiopharmaceuticals, instrumentation, types of imaging and therapeutic procedures performed, computer applications, related allied health professions, and healthcare ethics. Offered Fall.

NMT 314 Cr.1

### Cross-Sectional Anatomy

This course revisits anatomy specifically from an imaging perspective. Students will learn to identify normal and abnormal structures on CT and MRI scans and locate topographic landmarks on diagnostic and simulation images. Prerequisite: BIO 313 with a grade of "C" or better. Students with credit in RT 421 cannot earn credit in NMT 314. Offered Fall.

NMT 344 Cr.2

### Medical Ethics and Health Administration

This course will focus on medical ethics, diversity, inclusive excellence, as they pertain to the profession of imaging sciences. We will also have a full review of the health information systems that support the technologist in their role in taking care of patients. Prerequisite: admitted into one of the NMT or RS programs. Offered Spring.

NMT 398 Cr.2

### Research Writing in Nuclear Medicine Technology

This course focuses on students learning how to interpret published data and how to write an article ready for publication in professional journals in the field of nuclear medicine. Students in the Nuclear Medicine Technology Program will learn how to read, review, and comprehend NMT literature through a series of different writing exercises. Students will have opportunities to become comfortable deciphering the most up to date journal publications writing a journal article. Students will draft and revise their own work to become publication ready in "The Journal of Nuclear Medicine Technology. Prerequisite: concurrent enrollment in NMT 399; admission to NMT Program. Offered Spring.

NMT 399 Cr.1

### Applied Research Writing in Nuclear Medicine Technology

This applied writing lab focuses on students practicing the art of interpreting data and summarizing NMT data. Learning how to summarize data and to write an article ready for publication in professional journals in the field of nuclear medicine will assist them in becoming successful in the field. The applied setting will offer students an opportunity to understand and perfect the different parts of writing an NMT research proposal. The applied writing lab provides opportunities for students to draft and revise their own work to become publication ready in "The Journal of Nuclear Medicine Technology. Prerequisite: concurrent enrollment in NMT 398; admission to NMT Program. Offered Spring.

NMT 401 Cr.2

**Management and Methods of Patient Care I**

The survey of hospital administrative procedures including medical terms and medical ethics. Prerequisite: admission to the NMT Program; assignment to a clinical internship site. Offered Fall, Spring.

NMT 403 Cr.2-4

**Anatomy, Physiology and Pathology**

The anatomy, physiology and pathology of the human organ systems treated in the application of nuclear medicine. Prerequisite: admission to the NMT Program; assignment to a clinical internship site. Offered Annually.

NMT 404 Cr.1-3

**Management and Methods of Patient Care II**

Skills in problem-solving, critical thinking and clinical decision making are developed, as well as oral and written clinical communication skills. Administrative duties including budgeting, medical and legal considerations, and political issues affecting patient care are discussed. Focus on basic measures necessary to provide quality patient care. Basic principles of record keeping and confidentiality of information are explained. Prerequisite: admission to the NMT Program; assignment to a clinical internship site. Offered Fall, Spring.

NMT 405 Cr.1-5

**Radiation Protection**

Properties of alpha, beta, gamma, and x-ray radiations, their effects upon human beings and methods for protecting patients and staff from unnecessary exposure and possible injury. Prerequisite: admission to the NMT Program; assignment to a clinical internship site. Offered Annually.

NMT 407 Cr.2-5

**Clinical Instrumentation and Techniques**

Structure, operating characteristics and practice in use of nuclear radiation detection instruments and radioisotope handling devices used in medical diagnosis and therapy. Prerequisite: admission to the NMT Program; assignment to a clinical internship site. Offered Annually.

NMT 412 Cr.3-9

**Clinical Nuclear Practicum I**

The supervised use of radionuclides in imaging and scanning of patients for diagnostic purposes. Prerequisite: admission to the NMT Program; assignment to a clinical internship site. Offered Annually.

NMT 413 Cr.3-9

**Clinical Nuclear Practicum II**

The supervised use of radionuclides in vitro and in vivo in patients for diagnostic purposes. Prerequisite: admission to the NMT Program; assignment to a clinical internship site. Offered Annually.

NMT 416 Cr.1-3

**Nuclear Medicine Quality Control Practicum**

Elution of Mo/Tc generator, preparation and testing of radiopharmaceutical products. Gamma Camera uniformity, relative sensitivity and spatial linearity and resolution testing. The use of flood field and bar phantoms on in vivo imaging detectors in the nuclear medicine imaging laboratory. Prerequisite: admission to the NMT Program; assignment to a clinical internship site. Offered Annually.

NMT 417 Cr.2-5

**Nuclear Radiation Physics and Instrumentation**

Properties of alpha, beta and gamma radiations; their origins and interactions with matter; their control and shielding; and the statistics of counting. Prerequisite: admission to the NMT Program; assignment to a clinical internship site. Offered Annually.

NMT 418 Cr.1-3

**Clinical Procedures Review I**

Classroom technique to establish clinical practices used in nuclear medicine imaging; develop techniques used in planar and SPECT imaging. The fundamental skills of patient care, radiopharmaceutical preparation and administration. Emphasis is also on computer processing techniques used in coordination with imaging procedures. Duration: two semesters. Prerequisite: admission to the NMT Program; assignment to a clinical internship site. Offered Annually.

NMT 419 Cr.1-3

**Clinical Radiation Biology**

Cellular and organ responses to radiation sources and radionuclides employed in nuclear medicine. Prerequisite: admission to the NMT Program; assignment to a clinical internship site. Offered Annually.

NMT 422 Cr.1-4

**Clinical Procedures Review II**

Classroom technique to establish clinical practices used in nuclear medicine imaging. To develop techniques used in planar and SPECT CT imaging that has been developed in addition to the previous course "Clinical Procedures Review" (NMT 418). The fundamental skills of patient care, radiopharmaceutical preparation and administration will be reviewed. Emphasis is also in computer processing techniques used in coordination with imaging procedures. Prerequisite: admission to the NMT Program; assignment to a clinical internship site. Offered Fall, Spring.

NMT 423 Cr.1-5

**Radiopharmacy and Pharmacology**

The study of radiopharmacology and radiochemistry of isotopes used in clinical nuclear medicine for research, diagnosis, and therapy. This course includes lecture and field work. Prerequisite: admission to the NMT Program; assignment to a clinical internship site. Offered Fall, Spring.

NMT 427 Cr.1-5

**Clinical Evaluation of Mathematical Data in Nuclear Medicine**

This is a study of data collection, reduction and enhancement by computers used in Nuclear Medicine to generate interpretable images and data for physicians to diagnose and treat patients. This course includes lecture and field work. Prerequisite: admission to the NMT Program; assignment to a clinical internship site. Offered Fall, Spring.

NMT 429 Cr.1-5

**Multimodality Imaging**

This course is designed to present a more in depth overview of all imaging modalities that can be done simultaneously with gamma cameras and PET cameras (i.e. PET/CT, SPECT/CT, PET/MRI, etc.). It will be an overview of the cross sectional anatomy, physics and instrumentation that is offered from these modalities. Specific topics will include; physics, instrumentation, scanning and image production. Comparison of cross sectional anatomy, specific to the modality and PET or SPECT imaging will be covered. Emphasis will be placed on patient considerations for each modality, image production and processing, patient and technologist safety, radiation protection and/or procedure protocol. This course includes lecture and field work. Prerequisite: admission to the NMT Program; assignment to a clinical internship site. Offered Fall, Spring.

NMT 499 Cr.3

**Independent Study**

Independent projects under the direction and supervision of a member of the clinical staff. Hours arranged. Prerequisite: admission to the NMT Program; assignment to a clinical internship site. Offered Annually.