Nuclear Medicine Technology

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Undergraduate major: nuclear medicine technology (B.S.)

Web site: http://www.medicine.uiowa.edu/NMT/

Nuclear medicine technologists are professionals in a medical specialty that uses radioactive tracers for diagnostic, therapeutic, and research purposes. Technologists generally are employed in hospitals and clinics. They work hand-in-hand with nuclear medicine physicians, health physicists, radiopharmacists, and radiochemists as an integral part of a highly trained specialty team.

In addition to using sophisticated detectors and computers to trace the movement and localization of radioactive tracers in the human body, nuclear medicine technologists have responsibilities that include radiation safety, quality control testing, radiopharmaceutical preparation and administration, and general patient care.

The Nuclear Medicine Technology Program is fully accredited by the Joint Review Committee on Educational Programs in Nuclear Medical Technology (JRCNMT).

Nuclear medicine technology is one of two undergraduate majors in the field of medical imaging offered by the Carver College of Medicine. Students interested in radiologic technology, computed tomography, magnetic resonance imaging, cardiovascular interventional, diagnostic medical sonography, or radiation therapy may complete the major in radiation sciences; see Radiation Sciences in the Catalog.

The Carver College of Medicine is located on the University of Iowa health sciences campus, which includes University of Iowa Hospitals and Clinics, one of the nation’s largest university-owned teaching hospitals. For information about the college’s academic programs and resources, see Carver College of Medicine in the Catalog.

Undergraduate Program of Study

- Major in nuclear medicine technology (Bachelor of Science)

Undergraduate study in nuclear medicine technology is guided by the academic rules and procedures outlined under "Undergraduate Programs of Study" in the Carver College of Medicine section of the Catalog.

Bachelor of Science

The Bachelor of Science with a major in nuclear medicine technology requires a minimum of 120 s.h. of credit. Work for the degree includes a set of courses that are prerequisite to entering the major, 60 s.h. of course work in the major, and elective course work sufficient to complete the minimum of 120 s.h. required for graduation.

Students who plan to complete all requirements for the degree at the University of Iowa enter the University as students in the College of Liberal Arts and Sciences (CLAS) with a nuclear medicine technology interest. As CLAS students, they complete the course work that is prerequisite to entering the major.

Admission to the major is competitive; the program accepts a maximum of 8 students per year. Students must apply to the major by January 15 of the year in which they wish to enter it. Personal interviews with qualified applicants are scheduled in February, and the class is selected by March 15. The program begins the following fall semester and lasts two years.

Students who are admitted to the major become Carver College of Medicine students. Upon completing the program successfully, they are granted a Bachelor of Science degree. Graduates are eligible for national certification as nuclear medicine technologists.

The program strongly advises students entering the University to pursue a course of study that is applicable to another major, most commonly biology, chemistry, biochemistry, or microbiology, so that if they are not admitted to the Nuclear Medicine Technology Program, they still may complete a major and receive a bachelor’s degree.

The Bachelor of Science with a major in nuclear medicine technology requires the following work.

PREREQUISITES TO THE NUCLEAR MEDICINE TECHNOLOGY MAJOR

Students must complete the following prerequisite courses and must have earned 60 s.h. of college credit with a cumulative g.p.a. of at least 2.50 before they may enter the nuclear medicine technology major. In addition to providing a foundation for the major, the prerequisite courses are good preparation for other majors.

Rhetoric:

RHET:1030 Rhetoric 4 s.h.

Culture, society, and the arts—3 s.h. in each of two of these (total of 6 s.h.):

Historical Perspectives approved course work 3 s.h.
International and Global Issues approved course work 3 s.h.
Literary, Visual, and Performing Arts approved course work 3 s.h.
Values, Society, and Diversity approved course work 3 s.h.

See General Education Program (College of Liberal Arts and Sciences) in the Catalog for approved courses in the culture, society, and the arts areas.

Mathematics—one of these:

MATH:1020 Elementary Functions 4 s.h.
MATH:1440 Mathematics for the Biological Sciences 4 s.h.
A more advanced mathematics course

Introductory chemistry with laboratory:
CHEM:1110 Principles of Chemistry I 4 s.h.
Introductory physics—one of these:
PHYS:1400 Basic Physics 3 s.h.
PHYS:1511 College Physics I 4 s.h.
Psychology:
PSY:1001 Elementary Psychology 3 s.h.
Medical terminology:
CLSA:3750 Medical and Technical Terminology 2 s.h.
Anatomy and physiology—students must complete one of the three options below.
Option 1 (one course, 4 s.h.):
ACB:1199 Human Anatomy and Basic Physiology for Radiation Science 4 s.h.
Option 2 (two courses, 6-7 s.h.)—one of these:
ACB:3110 Principles of Human Anatomy 3 s.h.
ACB:3113 Human Anatomy Online 4 s.h.
And one of these:
HHP:1300 Fundamentals of Human Physiology 3 s.h.
HHP:3500 Human Physiology 3 s.h.
Option 3 (three courses, 7 s.h.)—both of these:
HHP:1100 Human Anatomy 3 s.h.
HHP:1110 Human Anatomy Laboratory 1 s.h.
And one of these:
HHP:1300 Fundamentals of Human Physiology 3 s.h.
HHP:3500 Human Physiology 3 s.h.

RECOMMENDED PRE-MAJOR COURSES
The Nuclear Medicine Technology Program strongly recommends that students who intend to apply to the major take the following course work in addition to the required prerequisite courses listed above.
Both of these:
CHEM:1120 Principles of Chemistry II 4 s.h.
RSP:1100 Introduction to the Radiation Sciences 1 s.h.
One of these:
BIOL:1140 Human Biology 4 s.h.
BIOL:1411 Foundations of Biology 4 s.h.
One of these:
STAT:1020 Elementary Statistics and Inference 3 s.h.
STAT:3510 Biostatistics 3 s.h.
STAT:4143 Introduction to Statistical Methods 3 s.h.
One of these:
CS:1020 Principles of Computing 3 s.h.
CS:1110 Introduction to Computer Science 3 s.h.
Prospective students are encouraged to consult the Nuclear Medicine Technology Program office to plan an appropriate pre-major program of study.

COURSE WORK IN THE MAJOR
Students admitted to the nuclear medicine technology major spend two years in a clinical curriculum that is organized in accordance with the JRCNMT Essentials of an Accredited Educational Program in Nuclear Medicine Technology. They complete course work in the following areas: radiopharmacy, radiation safety and radiobiology, patient care, nuclear medicine and positron emission tomography (PET) procedures, radiation physics and instrumentation, administration and management, medical and professional ethics, research methodology, and computed tomography (CT). Practical clinical rotations focus on nuclear medicine, PET and CT imaging, nuclear medicine therapy, clinical radiopharmacy, nuclear medicine computer applications, and quantification of radioactivity in vivo and in vitro.

Courses
RSNM:3120 Fundamentals of Nuclear Medicine and PET 6 s.h.
Introduction to medical specialty of nuclear medicine and molecular imaging; basic theories of radiation protection, radiation physics and nuclear medicine instrumentation, radiopharmacy, nuclear medicine and positron emission tomography (PET) clinical procedures, professional standards of nuclear medicine technologist. Requirements: Nuclear Medicine Technology Program enrollment.

RSNM:3121 Nuclear Medicine Technology Clinical Internship I 3 s.h.
Hands-on clinical experience working with patients and performing routine nuclear medicine diagnostic imaging procedures under direct supervision of qualified clinical instructors. Requirements: Nuclear Medicine Technology Program enrollment.

RSNM:3131 Radiopharmaceuticals 3 s.h.
Introduction to radiopharmaceuticals; emphasis on physical, chemical, and biologic properties and their clinical use; fundamental aspects of radiopharmaceuticals including characteristics, preparation, quality control, and clinical use. Requirements: Nuclear Medicine Technology Program enrollment.

RSNM:3195 Health Informatics I 3 s.h.
Technological tools that support health care administration, management, and decision making. Requirements: graduate standing. Same as MED:5300, SLIS:5900, HMP:5370, IE:5860, IGPI:5200.

RSNM:3220 Nuclear Medicine and PET Clinical Procedures 3 s.h.
Proper execution of nuclear medicine and PET procedures from a technical point of view; published protocols and procedures specific to the University of Iowa Hospitals and Clinics; routine set up, common errors, artifact identification, computer processing protocols, and patient care concerns identified for each procedure; review of human anatomy, physiology, and pathology germane to understanding and proper execution of nuclear medicine procedures. Requirements: Nuclear Medicine Technology Program enrollment.

RSNM:3221 Nuclear Medicine Technology Clinical Internship II 3 s.h.
Progressive responsibility working with patients and performing nuclear medicine and PET clinical procedures under direct supervision of qualified clinical instructors. Requirements: Nuclear Medicine Technology Program enrollment.

**RSNM:3231 Nuclear Medicine Instrumentation**

Instruments used in medical imaging to generate and detect ionizing radiation (i.e., SPECT/CT and PET/CT scanners, dose calibrators, well counters, survey meters); focus on instrument quality control testing. Requirements: Nuclear Medicine Technology Program enrollment.

**RSNM:3321 Nuclear Medicine Technology Clinical Internship III**

Progressive responsibility working with patients and performing nuclear medicine and PET clinical procedures under direct supervision of qualified clinical instructors. Requirements: Nuclear Medicine Technology Program enrollment.

**RSNM:4121 Nuclear Medicine Technology Clinical Internship IV**

Progressive responsibility working with patients and performing nuclear medicine and PET clinical procedures under direct supervision of qualified clinical instructors. Requirements: Nuclear Medicine Technology Program enrollment.

**RSNM:4221 Nuclear Medicine Technology Clinical Internship V**

Progressive responsibility working with patients and performing nuclear medicine and PET clinical procedures under direct supervision of qualified clinical instructors. Requirements: Nuclear Medicine Technology Program enrollment.

**RSNM:4222 NMT Capstone and Certification Exam Preparation**

Students in final semester of program work together to organize and deliver capstone and certification exam preparation course; review of specific topics and oral presentations by each student; preparation and distribution of detailed written outlines of exam content; series of content-specific quizzes, midterm, and final "Mock Board" exam to evaluate student learning and preparedness for taking the NMTCB and ARRT national certification exams; preparation and submission of capstone portfolios that provide evidence of scholarly and professional progress. Requirements: Nuclear Medicine Technology Program enrollment.

**RSNM:5301 Health Informatics II**

Selected health informatics initiatives, including computer-based patient records, physiologic monitoring, networking, imaging, virtual reality; participation in an interdisciplinary project team focused on an informatics innovation; application and research seminars. Same as BME:5252, IE:5870, IGPI:5210.