



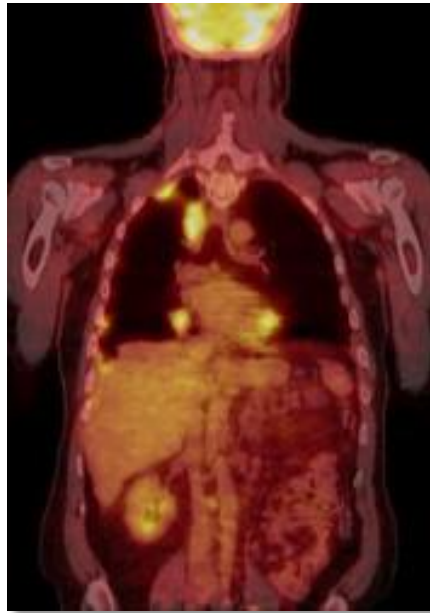
University of Tennessee
Medical Center at Knoxville

School of Nuclear Medicine Technology

Nuclear Medicine Department
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2009-2011 Information Brochure



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Application deadline: April 15th for class beginning in the fall.

********Information contained in this brochure is subject to revision. Prospective students are strongly encouraged to consult with the school officials on a regular basis.***

UTMC School of Nuclear Medicine Technology

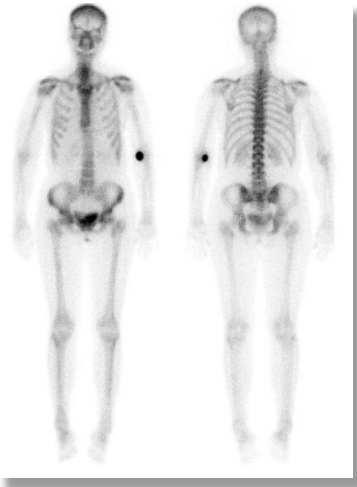
A High Tech Health Care Career for Today and Tomorrow

If you have a keen interest in the health sciences and computer technology and are looking for a people-oriented career, consider Nuclear Medicine Technology! Nuclear Medicine combines computer technology, advanced medical instrumentation, chemistry, physics, mathematics and radioactive materials to diagnose and treat disease. Nuclear medicine is able to provide unique information about both the structure and function of virtually every major organ system in the body. It is this unique ability to characterize and quantify physiologic function at the molecular level that separates it from other imaging modalities, such as X-ray.



Facts about Nuclear Medicine:

There are nearly 100 different diagnostic and therapeutic nuclear medicine imaging procedures available today. An estimated 10 to 12 million nuclear medicine imaging and therapeutic procedures are performed each year in the United States.



Nuclear medicine procedures are unique, cost-effective, and safe. The amount of radiation in a nuclear medicine procedure is comparable to that received during a diagnostic x-ray. Even children commonly undergo nuclear medicine procedures to evaluate bone pain, injuries, infection, kidney or bladder function, and gastrointestinal maladies.

Common adult nuclear medicine applications include diagnosis and treatment of hyperthyroidism, cardiac stress tests to evaluate coronary artery disease, oncology scans, bone scans for orthopedic injuries, liver and gall bladder procedures to diagnose abnormal function or blockages, and lung scans for blood clots.

The Technologist's Role:

Nuclear medicine technologists are highly specialized health care professionals who perform an integral role on the nuclear medicine/molecular imaging team in diagnosing and treating disease, working with physicians, patients, physicists, nuclear pharmacists, computer specialists, nurses, secretaries and other health care professionals. They have direct patient contact; prepare, calibrate and administer radiopharmaceuticals for diagnosis and therapy; perform patient imaging procedures (including computer processing) using sophisticated radiation-detecting instrumentation; operate imaging, lab and computer instrumentation; and ensure radiation safety.

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Opportunity for Direct Patient Care

During an imaging procedure, the technologist works directly with the patient. The technologist gains the patient's confidence by obtaining pertinent history, describing the procedure, and answering questions. The technologist monitors the patient's physical condition during the course of the procedure and notes any specific patient comments which might indicate the need for additional images or be useful to the physician in interpreting the results of the procedure. The technologist works independently to apply complex information and knowledge to maximize individual patient diagnostics.



Employment Opportunities

The need for dedicated, energetic individuals is continually expanding. In 2009, Nuclear Medicine Technologists held about 21,670 jobs. The Department of Labor predicts that employment of Nuclear Medicine Technologists is expected to increase by 16 percent from 2008 to 2018. Nuclear Medicine Technologists work in a variety of clinical settings, including community hospitals, university-affiliated teaching hospitals and medical centers, outpatient imaging facilities, physician offices, public health institutions, and government and private research centers. Two-thirds of all jobs are in a hospital setting. NM Technologists generally work ~ 40 hours per week, with some on-call periods.

Salary Characteristics

Salaries vary depending on employer and geographical location. A Bureau of Labor and Statistics survey (2009) reported national mean annual earnings of nuclear medicine technologists were \$68,450. The middle 50 percent earned between \$57,640 and \$79,630. The lowest 10 percent earned less than \$48,710 and the highest 10 percent earned more than \$90,650. Median annual earnings of nuclear medicine technologists in general medical and surgical hospitals were \$67,910. A survey of corporate HR departments by Salary.com (2010) showed a typical nuclear medicine technologist working in the United States earning a median base salary of \$ 68,553, with half earning between \$62,888 and \$74,701.

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Career Alternatives

Technologists have a variety of alternative career paths available, including:

- Senior staff technologist
- Research technologist
- Chief technologist or Departmental administrator
- Education-program director, clinical coordinator, professor or instructor
- Industry sales representative
- Technical specialist or vendor applications specialist

Certification

Most employers and an increasing number of states now require certification and/or licensure. This professional requirement will expand career choices for the future. Upon completion of the accredited UTMC Nuclear Medicine technology program, graduates are eligible for certification through examination by one of the national credentialing agencies (NMTCB or ARRT). The school maintains a certification exam pass rate of > 98% by graduates on their first attempt, with > 40% passing with honors.

An Exciting Future:

Nuclear Medicine will continue to be a field at the forefront of modern clinical medicine and technological development. The future has never been brighter thanks to:

- The development of new radiopharmaceuticals for diagnosis and therapy
- Research and development of cancer-detecting and cancer-killing agents, such as genetically engineered, radioactive antibodies
- The use of special radiation detectors in the operating room to assist surgeons in the localization of cancerous tissue, tumors, and normal anatomy.
- The expanding clinical use of the technology known as PET (Positron Emission Tomography) which provides new and unique means of studying biochemistry and metabolism within living tissues
- The merging and fusion of different imaging modalities such as PET and CT (computed tomography) in one instrument.



UTMC School of Nuclear Medicine Technology

Goals and Mission of the UTMC Program

Established in 1982 and sponsored by the University of Tennessee Medical Center, the Nuclear Medicine Technology program is designed to produce competent nuclear medicine technologists of a high professional standard. Our expectation is to provide a continuous supply of well qualified nuclear medicine technologists to better serve the medical communities of East Tennessee and surrounding states. The program is committed to excellence in Nuclear Medicine education through state of the art imaging technologies and unmatched clinical experience opportunities.



Program Description

The School of Nuclear Medicine Technology is a 12-month certificate program designed to prepare students for certification as Nuclear Medicine Technologists. The program is professionally accredited by the *Joint Review Committee on Educational Programs in Nuclear Medicine Technology* (JRC-NMT)*. The full time program includes both didactic study and clinical practice. Areas of instruction include clinical nuclear medicine, nuclear physics, radiochemistry, patient care, radiation safety, radiobiology, nuclear imaging instrumentation, and computer applications. Hands on, clinical training is emphasized as each student participates in clinical training at UTMC (the area's only Level 1 trauma center and academic teaching hospital) and seven local affiliated sites. Students successfully completing the program are eligible to take the national certification exams for Nuclear Medicine Technologists. In addition to the certificate program, a 4-year BS degree is also available through affiliation with the University of Tennessee at Knoxville and Middle Tennessee State University.



* The JRC-NMT is nationally recognized by the United States Department of Education (USDE) and the Council for Higher Education Accreditation (CHEA) as the sole agency authorized to accredit professional educational programs in nuclear medicine technology. It provides the foundation for excellence in the nuclear medicine profession by setting standards for education and accrediting academic programs that meet or exceed those standards.

Locally Affiliated Clinical Institutions

Knoxville, TN:

Fort Sanders Regional Medical Center
East Tennessee Children's Hospital
University Cardiology Group
Cardinal Health (Radiopharmacy)

Blount Memorial Hospital Maryville, TN
FS Loudon Medical Center, Loudon, TN
Methodist Medical Center Oak Ridge, TN

UTMC School of Nuclear Medicine Technology

Admission Requirements:

Admission is open to those individuals already possessing a bachelor's degree (with elective coursework in the sciences), or having prior qualifications in a clinically related allied health profession (i.e. radiography, medical technology, nursing) or completion of an approved undergraduate pre-nuclear medicine technology curriculum.



Specifically, the program requires an individual to be either a:

- Registered (or registry eligible) Radiological Technologist **or...**
- Registered (or registry eligible) Medical Technologist **or...**
- Registered (or registry eligible) Nurse **or...**
- Have a Bachelor's degree with emphasis in biology, chemistry, math, or physics (see note 1) **or...**
- Completion of an approved 3 year pre-technology curriculum (UTK, MTSU, or equal) (see note 2)

Note 1: Applicants with a bachelor's degree must have completed introductory course work in chemistry, physics, anatomy/physiology, and algebra.

Note 2: Applicants pursuing a baccalaureate program may apply to the Nuclear Medicine Technology program during their junior year, but must complete the minimum undergraduate semester hours (see specific curriculum) prior to the start of program. This includes the UTK College of Arts and Sciences or MTSU College of Basic and Applied Sciences general education requirements. It is highly recommended that the student maintain a *minimum* cumulative grade point average of 2.50.

Standard Skills Necessary for Nuclear Medicine

To participate in the clinical education portion of the Nuclear Medicine Technology Program, the applicant must possess additional *non-academic* skills, consistent with the duties of the entry-level technologist in a professional position.



The applicant should have the ability to:

- Lift and carry ~ thirty pounds of weight.
- Lift and transfer patients to and from wheelchairs, stretchers, beds and imaging tables.
- Position patients for exams.
- Move and/or adjust the necessary hospital equipment for patient care and patient imaging by manipulating dials, switches, push buttons, and keyboards.
- Respond appropriately to sounds such as the patient's voice and movements, at a normal conversational volume.
- Demonstrate visual acuity necessary to differentiate subtle shades of grey/color used in nuclear imaging.
- Respond appropriately to equipment signals such as sound and light.
- Stand and perform for prolonged periods without breaks in a typical shift of 8 hours.
- Clearly communicate orally and in writing with patients, doctors and other personnel.
- Follow verbal and written directions

UTMC School of Nuclear Medicine Technology

The Application Process:

All applicants must submit a *complete* application to be considered. Requests for applications can be made to the UTMCK School of Nuclear Medicine Technology, 1-VOL-305-9726 or downloaded from <http://www.utmedicalcenter.org/radiology>.

A complete application consists of

- (1) The application form
- (2) A personal application narrative describing your background, hobbies and interests, reasons for choosing Nuclear Medicine as a career, and reasons for choosing the UTMC Nuclear Medicine Technology program.
- (3) All transcripts from post-secondary schools, colleges, and/or technical schools. These may be sent directly to the UTMC School of Nuclear Medicine Technology, Atten: Program Director (Please note any courses currently in progress or to be completed prior to school)
- (4) Three personal reference forms or letters of personal reference by individuals who are familiar with the applicant's personal, academic, and/or employment background.

Applicants are considered without regard to sex, race, creed, or national origin. All applicants whose native language is not English are required to submit scores on the TOEFL exam.

The deadline for receipt of *all* application materials is **APRIL 15th** for the following fall class. Incomplete applications will not be considered, but will be kept on file for one year.

The Selection Process:

Following the application deadline, qualified and promising applicants are invited for a personal interview with the admissions committee. The admissions committee considers *all* aspects of each applicant's record and will offer admission to the best-qualified individuals. To facilitate the unequalled clinical experience opportunities offered by this program, class size is limited to no more than 7 students per year.

The admissions committee considers positive applicant attributes to include:

- Maturity
- Knowledge about and motivation towards a career in nuclear medicine
- Any previous health care experience
- An aptitude for academic achievement, particularly in the sciences
- Good listening and communication skills

It is also highly recommended that applicants arrange an observation visit to a Nuclear Medicine Department prior to application. To clarify procedures, discuss problem areas, or answer any questions, the program director will arrange an appointment with any applicant at a mutually agreeable time.

UTMC School of Nuclear Medicine Technology

Current Tuition Expenses for the Nuclear Medicine Technology Program

Certificate Program (Non degree seeking) students:

Certificate program students pay a hospital allied health professions flat rate tuition fee of \$5,000 for the program. Certificate students are eligible for financial aid (private student loans) through various organizations such as Sallie Mae. See www.salliemae.com for more information and application.

UTK Baccalaureate Program:

Students applying program hours towards a UTK bachelor's degree will pay full undergraduate tuition to the University of Tennessee, Knoxville. See www.utk.edu for current tuition rates. The spring 2011 tuition and fees rate was \$ 3691.00 /semester. The Nuclear Medicine Technology program is the equivalent of 3 semesters.

UTK enrolled students are eligible for Federal financial aid programs (Title IV Funds) authorized under the Higher Education Act of 1965.

Miscellaneous Expenses:

Required books will be provided at the beginning of the school year (cost ~ \$300).

Students are responsible for their own meals, lodging, uniforms (two white lab coats) and transportation.

Applicants, if selected, will be responsible for a pre-admission drug screen (cost ~ \$50).

Students not currently CPR certified will be responsible for a CPR training class (cost ~ \$30).

Students will be responsible for annual TSNMT meeting registration (cost ~ \$50) and national certification examination (NMTCB or ARRT) fees (cost ~ \$150).

Students must be in good mental and physical health, and maintain responsibility for their own medical, surgical and dental expenses. The school requires that all students have health insurance. If necessary, student health insurance is available to University of Tennessee Medical Center students for a modest premium through an independent agent.

Currently, students are covered under the Medical Center's blanket professional liability insurance policy while participating in school sponsored activities, thus are not required to carry additional liability insurance.

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Grants and Scholarships:

The Society of Nuclear Medicine offers the following scholarships to students pursuing clinical NMT education. See <http://www.snm.org> or call 703-652-6795, with any questions

SNMTS Clinical Advancement Scholarship
Paul Cole Scholarships
PDEF Mickey Williams Minority Student Scholarship
PDEF Professional Development Scholarship

The American Society of Radiologic Technologists offers the following scholarships to outstanding entry-level radiologic sciences students. For more information about these scholarship programs or instructions on how to apply, contact the Foundation at 800-444-2778, Ext. 2541, by fax at 505-298-5063 or by e-mail at foundation@asrt.org.

Jerman-Cahoon Scholarship Program
Royce Osborn Minority Scholarship Program

School of Nuclear Medicine Technology Curriculum @ UT Medical Center

<u>Fall Semester</u>		<u>Credit Hours</u>
NMT 410	Physics for Nuclear Medicine I	3
NMT 411	Nuclear Instrumentation	3
NMT 412	Radiopharmacy/Radiochemistry	2
NMT 420	Clinical Nuclear Medicine I	4
NMT 450	Clinical Practicum I	4
<u>Spring Semester</u>		
NMT 415	Physics for Nuclear Medicine II	3
NMT 425	Computer Applications	3
NMT 430	Clinical Nuclear Medicine II	4
NMT 460	Clinical Practicum II	6
<u>Summer Semester</u>		
NMT 475	Registry Review	2
NMT 440	Clinical Nuclear Medicine III	4
NMT 470	Clinical Practicum III	6
	Total Hours	44

All didactic courses are taught on the medical center campus.

UTMC School of Nuclear Medicine Technology

The UTK Nuclear Medicine Technology BS Degree Curriculum

The curriculum (3+ 1) involves 3 years (~ 90 credit hours) of study in the University of Tennessee College of Arts and Sciences, plus 12 consecutive months of clinical and didactic training in the School of Nuclear Medicine Technology at the University of Tennessee Medical Center, Knoxville, and leads to a Bachelor of Science degree with a major in Nuclear Medicine Technology. In addition, a Certificate in Nuclear Medicine Technology will be awarded by UT Medical Center. The student will then be eligible to sit for the certification examination by the Nuclear Medicine Technology Certification Board (NMTCB) or the American Registry of Radiologic Technologists (ARRT).

Requirements for the Bachelor of Science • Pre-Professional Programs Major • Nuclear Medicine Technology Concentration

First Year	Hours Credit
English 101-102; or equivalent	6
Chemistry 120*-130	8
Mathematics	6-8
Biology 130	4
Biology 140	4
Communication Studies 210	3
Second Year	
Chemistry 350-360, 369	8
Foreign Language - Intermediate Level	6
Non-U.S. History	6
Humanities	3
Social Sciences	6
Computer Science 100 or 102	3-4
Third Year	
Biochemistry and Cellular and Molecular Biology 230	5
Ecology and Evolutionary Biology 240	4
Physics 221-222	8
Humanities	3
Upper-Level Distribution	6
Communicating through Writing (WC) course	3

SENIOR

Completion of the Nuclear Medicine Technology program at UTMCK (12-month program).

Bachelors Degree Program Planning:

The importance of program planning for the pre-Nuclear Medicine Technology student cannot be overstressed. It is essential for these students to develop their programs carefully in order to present a well-rounded pre-professional program. Admission into the Nuclear Medicine Program at UTMCK is fairly competitive and at the discretion of the admissions committee of the Nuclear Medicine Technology program at the UT Medical Center in Knoxville. Completion of an undergraduate pre-nuclear medicine technology program at does not assure admission to the clinical phase of the nuclear medicine technology program. Therefore, students are strongly encouraged to plan an alternative program in the event admission to Nuclear Medicine Technology School is not achieved.

UTMC School of Nuclear Medicine Technology

Middle Tennessee State University at Murfreesboro Nuclear Medicine Technology BS Degree Curriculum

The (3+ 1) Medicine Technology degree program requires a successful completion of 3 years (minimum of 90 semester hours) academic work at MTSU followed by a minimum of 12 months of clinical training in the School of Nuclear Medicine Technology at the University of Tenn. Medical Center, Knoxville and result in a bachelors degree in science from MTSU with a health science concentration.

In addition, a Certificate in Nuclear Medicine Technology will be awarded by UT Medical Center. The student will then be eligible to sit for the certification examination by the Nuclear Medicine Technology Certification Board (NMTCB) or the American Registry of Radiologic Technologists (ARRT).

Recommended Curriculum at MTSU

FRESHMAN

Engl 1010, 1020 (Comm)	6
Math 1730 or 1910 (Math)	4
Chem 1110/111 (Nat Sci)	4
Chem 1120/1121	4
Biol 2010/2011 (Nat Sci)	4
Biol 2020/2021	4
Humanaities/Fine Arts	3
Comm 2200	3
Elective	1
	33

SOPHOMORE

Engl 2020 or 2030 or Hum 2610 (Hum/Fa)	3
Humanities/Fine Arts	3
Phys 2010/2011	4
Phys 2020/2021	4
Hist 2010, 2020	6
Chem 2030/2031 or 3010/3011	4
Chem 3530/3531 or 3020/3021	4
Hlth 3300	3
	31

JUNIOR

Biol 2230/2231	4
Biol 4150	3
CSci 1000	1
Psyc 1410	3
Social/Behavioral Sciences	3
Biology 3350	3
Nurs 3010	3
Psyc 4650	3
	26

SENIOR

Professional program credits (granted upon successful completion of first year of approved program)	
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More information can be found at:

http://www.mtsu.edu/chemistry/pre_prof.shtml

UTMC School of Nuclear Medicine Technology

Websites and Organizations with Additional Information:

For additional information on a career as a nuclear medicine technologist:

Society of Nuclear Medicine-Technologists Section

1850 Samuel Morse Dr.
Reston, VA 20190-5316
Telephone: 703-708-9000
Internet: <http://www.snm.org>

American Society of Radiologic Technologists

15000 Central Ave. SE.
Albuquerque, NM 87123
Telephone: 800-444-2778, press 5
Internet: <http://www.asrt.org>

Bureau of Labor and Statistics

Occupational Outlook Handbook, Nuclear Medicine Technology web page:
<http://stats.bls.gov/oco/ocos104.htm>

For a list of all accredited programs in nuclear medicine technology:

Joint Review Committee on Educational Programs in Nuclear Medicine Technology

2000 W. Danforth Rd., Ste 130 #203
Edmond, OK 73003
Telephone: 405-285-0546
Internet: <http://www.jrcnmt.org>

Information on technologist certification/licensure is available from:

American Registry of Radiologic Technologists

1255 Northland Dr.
St. Paul MN 55120-1155
Telephone: 651-687-0048
Internet: <http://www.arrt.org>

Nuclear Medicine Technology Certification Board

3558 Habersham @ Northlake, Bldg. 1
Tucker, GA 30084
Telephone: 404-315-1739
Internet: <http://www.nmtcb.org>

School of Nuclear Medicine Technology

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