



University of Tennessee
Medical Center at Knoxville

School of Nuclear Medicine Technology

1924 Alcoa Hwy, Knoxville, Tennessee 37920

2006-2007 Information Brochure

Program Director: Glenn Hathaway, BS, CNMT
E-mail: ghathawa@mc.utmck.edu

Note: As of May 16th, 2005 the application deadline changed to April 15th for all subsequent the classes beginning in the fall.

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:

The Nuclear Medicine Technologist is a highly specialized allied health care professional who works closely with the Nuclear Medicine physician. A technologist applies the art and skill of diagnostic evaluation and therapeutics through the safe and effective use of radionuclides.

Some of the technologist's primary responsibilities are to:

- Prepare and administer radioactive compounds, known as radiopharmaceuticals, for diagnosis and therapy
- Perform patient imaging procedures using sophisticated radiation-detecting instrumentation
- Provide images, data analysis, and patient information to the physician for diagnostic interpretation
- Evaluate new procedures for appropriateness in specific clinical settings and patient populations.

The technologist applies knowledge of radiation physics and safety regulations to limit radiation exposure to the general public, patients, and fellow workers. Professional growth and development is achieved through participation in medical and technical education and research to enhance the quality of patient care.



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
- Monitors the patient's physical condition during the course of the procedure
- Notes any specific patient comments which might indicate the need for additional images or might be useful to the physician in interpreting the results of the procedure
- Works independently to apply complex information and knowledge to maximize individual patient diagnostics

Employment Opportunities in Nuclear Medicine

The need for dedicated, energetic individuals is continually expanding. 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. Nuclear Medicine 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 (2004) reported median annual earnings of nuclear medicine technologists were \$56,450. The middle 50 percent earned between \$48,720 and \$67,460. The lowest 10 percent earned less than \$41,800, and the highest 10 percent earned more than \$80,300. Median annual earnings of nuclear medicine technologists in general medical and surgical hospitals were \$54,920. A survey of corporate HR departments by Salary.com (2006) showed a typical nuclear medicine technologist working in the United States earning a median base salary of \$56,730, with half earning between \$52,791 and \$61,538.

Career Alternatives

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

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

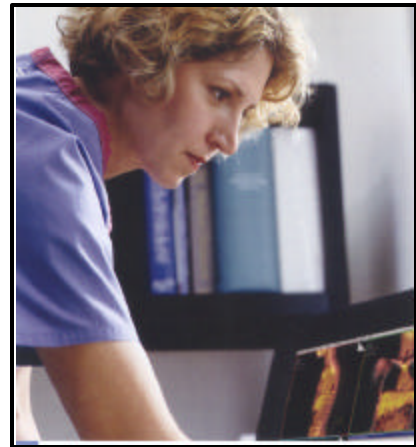
Certification

Upon completion of the accredited Nuclear Medicine technology program, qualified graduates are eligible for certification through examination by one of the national credentialing agencies (NMTCB or ARRT). Many employers and an increasing number of states now require certification or licensure. This professional requirement will expand career choices for the future.

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 expanding clinical use of the technology known as Positron Emission Tomography (PET) which provides new and unique means of studying biochemistry and metabolism within living tissues
- The use of special radiation detectors in the operating room to assist surgeons in the localization of cancerous tissue, tumors, and normal anatomy.



Goals and Mission of the UTMCK 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 at the University of Tennessee Medical Center is a JRC-NMT* fully accredited, 12-month certificate program designed to prepare students for certification as Nuclear Medicine Technologists. The full time program includes both didactic study and clinical practice. The didactic 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 UTM (the area's only Level 1 trauma center and academic teaching hospital). Student will also participate in clinical activities at six additional affiliated sites. Students successfully completing the program are eligible to take the national certification examinations 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 (*Joint Review Committee on Educational Programs in Nuclear Medicine Technology*) is nationally recognized as the accrediting agency for educational programs for nuclear medicine technologists by the United States Department of Education (USDE) and the Council for Higher Education Accreditation (CHEA). 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.

Local Affiliated Clinical Institutions:

Fort Sanders Regional Medical Center, Knoxville, TN
East Tennessee Children's Hospital, Knoxville, TN
St. Mary's Medical Center, Knoxville, TN
Methodist Medical Center, Oak Ridge, TN
Blount Memorial Hospital, Maryville, TN
Cardinal Health, Knoxville, TN (Radiopharmacy)

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.

Admission into 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 or MTSU) (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 the 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. These technical standards are 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.
- Communicate orally and in writing with patients, doctors and other personnel clearly and effectively
- Follow verbal and written directions



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-544-9726 or downloaded from <http://www.utmedicalcenter.org/radiology>.

A complete application consists of

- (1) The application form
- (2) An application narrative describing your reasons for choosing Nuclear Medicine
- (3) All transcripts from post-secondary schools, colleges, and/or technical schools. (Please note any courses currently in progress or to be completed prior to school) and
- (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 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 offers admission to the best-qualified individuals. To facilitate the unequalled clinical experience opportunities offered in this program, class size is limited to no more than 7 students per year.

Positive applicant attributes 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.

The program director will arrange an appointment with any applicant at a mutually agreeable time to clarify procedures, discuss problem areas, or answer any question.

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 fee of \$4,000. Certificate students are eligible for financial aid through The Educational Resources Institute (TERI), a consortium of private financial institutions and lenders. See www.teri.org for more information and application.

UTK Baccalaureate Program:

Students applying program hours towards a UTK bachelor's degree pay full undergraduate tuition to the University of Tennessee, Knoxville. As of the 2005-2006 school year, undergraduate tuition is \$2,645/semester (in-state). Nuclear Medicine Technology program is the equivalent of 3 semesters.

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

In addition, there are a limited number of scholarships available each year. Contact the program director for more information on scholarships.

Miscellaneous Expenses:

Books will be provided at the beginning of the school year and cost ~ \$200-300.

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

Students must be in good mental and physical health, and must 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 through The University of Tennessee Medical Center for a modest premium.

Currently, students are not required to carry additional liability insurance, as students are covered under the Medical Center's blanket professional liability insurance policy.

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.

Pertinent Names and Addresses:

Mr. Glenn Hathaway

Program Director

Ph: 1-VOL-544-9726

E mail: gthawawa@mc.utmck.edu

Mary Anne Hoskins

Chairperson, Arts and Sciences Advising Services, Univ. of Tennessee

1 Alumni Memorial Building

Office: 1-VOL-974-4481

E-mail: mhoskins@utk.edu

Andy Burden

Department of Chemistry, Pre-Nuclear Medicine Technology program coordinator and advisor Middle Tennessee State University

Ph:1-615-898-5466

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

The UTK Nuclear Medicine Technology BS Degree Curriculum

The curriculum (3+1) involves 3 years (94 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).

FRESHMAN	CREDIT HOURS
English 101-102; or equivalent	6
Chemistry 120-130	8
Mathematics	6-8
Biology 130	4
Biology 140	4
Speech Communication 210	<u>3</u>
	28-33
SOPHOMORE	
Chemistry 350, 360, 369	8
Foreign Language - Intermediate Level	6
Non US History	6
Humanities	3
Social Sciences	6
Computer Science 100 or 102	<u>3-4</u>
	32-33
JUNIOR	
BCMB 230, EEB 240	9
Physics 221-222	8
Humanities	3
Upper Level Distribution	6
Writing Intensive Course	3
Elective	<u>3</u>
	32

TOTAL: 94 hours minimum

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.

Middle Tennessee State University at Murfreesboro

Nuclear Medicine Technology BS Degree Curriculum

The curriculum (3+1) involves 3 years (~99 credit hours) of study in the College of Basic and Applied Sciences, plus 12 consecutive months of clinical training in the School of Nuclear Medicine Technology at the University of Tenn. Medical Center, Knoxville and leads to the Health Science Option Nuclear Medicine Technology of the BS degree in Science from MTSU. 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).

Freshman

English 111,112	6 hrs
Math 141,142	6 hrs
Chemistry 121,121L, 122,122L	8 hrs
BIOL 313,314	8 hrs
Electives	8 hrs

Sophomore

English 211, Humanities 213	6 hrs
Area IIA Elective	3 hrs
Physics 231,232, 232,234	8 hrs
History 201,202	6 hrs
CHEM 303/or 321,325/or 322	8 hrs
Social Work 464	3 hrs
Health 310	2 hrs

Junior

Biology 213,334, 415A, 430	13 hrs
CSCI 116	4 hrs
PHED or MS	2 hrs
STAT 313	3 hrs
Psych 465	3 hrs
Physics 333	3 hrs
Sociology 409	3 hrs

Senior

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

Websites and Organizations with Additional Information:

Additional information on a career as a nuclear medicine technologist is available from:

Society of Nuclear Medicine Technologists

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.
Internet: <http://www.asrt.org>

Bureau of Labor and Statistics

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

For a list of accredited programs in nuclear medicine technology:

Joint Review Committee on Educational Programs in Nuclear Medicine Technology

716 Black Point Road, PO Box 1149
Polson, MT 59860-1149
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
Internet: <http://www.arrt.org>

Nuclear Medicine Technology Certification Board

2970 Clairmont Rd., Suite 935
Atlanta, GA 30329.
Telephone: 404-315-1739
Internet: <http://www.nmtcb.org>