

**LAST REVIEW:** 2010-2011**NEXT REVIEW:** 2015-2016**STATUS:** A**COURSE TITLE:** Introduction to Nuclear Medicine Technology**COMMON COURSE NUMBER:** NMT 1002**CREDIT HOURS:** 3.0**CONTACT HOUR BREAKDOWN****CLOCK HOURS:**

Lecture: 48

Labs:

Clinic:

Other:

**PREREQUISITE(S):** Admission into program**COREQUISITE(S):** NMT 1002L and NMT 1430

**COURSE DESCRIPTION:** This course is designed to introduce the student to the field of nuclear medicine. Upon completion of this course, the student will have knowledge upon vital signs, patient care, universal precautions, and phlebotomy. The student will also receive a brief overview on radiation safety and the most common procedures performed in nuclear medicine.

**UNIT TITLES**

- 1.0 Overview of Nuclear Medicine
- 2.0 Interpersonal Communication
- 3.0 HealthCare Ethics
- 4.0 Patient Care & Body Mechanics
- 5.0 Universal Precaution
- 6.0 Administration of Pharmaceuticals & Radiopharmaceuticals
- 7.0 Venipuncture
- 8.0 Radiation Protection and Safety
- 9.0 Medical Terminology
- 10.0 Instrumentation and Quality Control
- 11.0 Common Nuclear Medicine Procedures

**ASSESSMENT:**

Please provide a brief description (250 characters maximum) that details how students will be assessed on the course outcomes.

1. **Announced and unannounced quizzes and Unit examinations:**
2. **Mid term and/or Final Exam (cumulative/comprehensive);**
3. **Assessment of reading and online assignments via submission of homework projects;**
4. **Participation in Discussion Forums on the e-learning site**
5. **Completion of group and individual projects as assigned**

**Common Course Number: NMT 1002****Unit 1      Overview of Nuclear Medicine*****General Outcome:***

1.0    The student shall be able to accurately recognize an overview of nuclear medicine.

***Specific Learning Outcomes***

Upon successful completion of this unit, the student should be able to:

- 1.1            Define Nuclear Medicine and differentiate it from other modalities.
- 1.2            Define radiopharmaceutical
- 1.3            Define half-life.
- 1.4            Understand and identify the role of the Nuclear Medicine Technologist is.
- 1.5            Identify common instrumentation used in nuclear medicine.

**Common Course Number: NMT 1002****Unit 2      Interpersonal Communication*****General Outcome:***

- 2.0    The student shall be able to accurately describe the effective modes of interpersonal communication.

***Specific Learning Outcomes***

Upon successful completion of this unit, the student should be able to:

- 2.1      Describe effective modes of communication.
- 2.2      Describe how to successfully communicate with geriatric patients.
- 2.3      Describe how to successfully communicate with pediatric patients.
- 2.4      Describe how to successfully communicate with combative patients.
- 2.5      Describe how to communicate with handicapped or special needs patients.
- 2.6      Differentiate empathy from sympathy.
- 2.7      List pertinent questions to ask a patient in order to obtain a thorough history.
- 2.8      Discuss the importance of non-verbal communication.
- 2.9      Discuss how religion and culture would impact standard hospital procedures.

**Common Course Number: NMT 1002****Unit 3      Healthcare Ethics*****General Outcome:***

- 3.0      The student shall be able to accurately describe ethical and legal issues faced in the healthcare field.

***Specific Learning Outcomes***

Upon successful completion of this unit, the student should be able to:

- 3.1      Define Ethics.
- 3.2      Discuss how ethics plays a huge role in the hospital.
- 3.3      Discuss how computer advancements now place a huge challenge on healthcare Confidentiality.
- 3.4      List the legal and ethical obligations that a Nuclear Technologist has.
- 3.5      Discuss scenarios of potential ethical situations that a Nuclear Technologist may encounter.
- 3.6      Discuss the Patient's Bill of Rights.
- 3.7      Discuss about patient's medical records such as the patient's chart, and what it contains and policies on how to properly handle it.
- 3.8      Define medical legal terms such as negligence, malpractice and tort.
- 3.9      State the Good Samaritan Law.

**Common Course Number: NMT 1002****Unit 4 Patient Care & Body Mechanics*****General Outcome:***

- 4.0 The student shall be able to accurately define patient care and proper body mechanics.

***Specific Learning Outcomes***

Upon successful completion of this unit, the student should be able to:

- 4.1 Discuss how to properly assess and interpret a patient's respiration rate and identify the normal and abnormal ranges.
- 4.2 Discuss how to properly assess and interpret a patient's blood pressure, what the normal and abnormal ranges are, and what the numbers represent.
- 4.3 Discuss how to properly assess and interpret a patient's pulse rate at various locations and what the normal and abnormal ranges are.
- 4.4 Discuss how to properly assess a patient's temperature at various locations and what the normal and abnormal ranges are at the respect sites.
- 4.5 Identify the various types of oxygen administration.
- 4.6 Identify various types of medical equipment, their terminology and demonstrate proper uses.
- 4.7 Discuss how to properly handle a patient with medical conditions and restrictions that require special handling such as a colostomy bag, urinary catheter, and chest drainage system.
- 4.8 Discuss and demonstrate how to establish proper body mechanics when lifting and transferring patients to reduce injury.
- 4.9 Discuss what the role of the healthcare provider is during a medical emergency.

**Common Course Number: NMT 1002****Unit 5      Universal Precaution*****General Outcome:***

- 5.0    The student shall be able to accurately describe how to practice proper universal precautions through infection control, aseptic and sterile techniques.

***Specific Learning Outcomes***

Upon successful completion of this unit, the student should be able to:

- 5.1            Discuss the cycle of infection.
- 5.2            Define and differentiate between sterilization and disinfection.
- 5.3            Demonstrate how to wear sterile gloves and prepare a sterile field.
- 5.4            Discuss Universal Precautions.
- 5.5            Discuss the proper mechanics of hand washing.
- 5.6            Explain what nosocomial infections are and how one would acquire them.
- 5.7            Discuss the proper methods of sterilization.
- 5.8            Explain the proper procedure for putting on and taking off caps, gowns, masks, And gloves in an isolation room.
- 5.9            Differentiate between viruses, bacteria, and fungi and discuss their means of transmission.
- 5.10          Discuss infection control practices in a healthcare setting such as dress attire, nail and hair hygiene.

**Common Course Number: NMT 1002****Unit 6 Administration of Pharmaceuticals & Radiopharmaceuticals*****General Outcome:***

- 6.0 The student shall be able to explain how to successfully administer radiopharmaceuticals and pharmaceuticals.

***Specific Learning Outcomes***

Upon successful completion of this unit, the student should be able to:

- 6.1 List the most commonly used radiopharmaceuticals in Nuclear Medicine.
- 6.2 List the half lives and energy of the common radiopharmaceuticals.
- 6.3 Understand the concept of radiopharmaceutical and kit preparation.
- 6.4 List all patient identifiers that can be used.
- 6.5 State the common methods of radiopharmaceutical and pharmaceuticals administration.
- 6.6 Discuss what signs and symptoms would demonstrate that a patient is having an adverse reactions.
- 6.7 Discuss what the technologist's role is in an event that a patient has an adverse reaction.
- 6.8 List the different stages of shock.

**Common Course Number: NMT 1002****Unit 7      Venipuncture*****General Outcome:***

7.0      The student shall be able to accurately describe proper phlebotomy techniques.

***Specific Learning Outcomes***

Upon successful completion of this unit, the student should be able to:

- 7.1      Differentiate between a straight stick, intravenous catheter and butterfly injections.
- 7.2      List varying needle gauges and identify the common gauges used to inject a patient.
- 7.3      List all supplies needed in order to perform an injection.
- 7.4      State proper tourniquet application.
- 7.5      Explain proper injection technique on a mannequin.
- 7.6      Define a vasovagal reaction.
- 7.7      Discuss how to properly administer solutions through an existing IV catheter.

**Common Course Number: NMT 1002****Unit 8      Radiation Protection and Safety*****General Outcome:***

- 8.0    The student shall be able to successfully identify radiation protection and safety techniques.

***Specific Learning Outcomes***

Upon successful completion of this unit, the student should be able to:

- 8.1            List and discuss the various types of radiation.
- 8.2            Discuss the principle behind time, distance, and shielding.
- 8.3            Explain what the purpose is of a film badge and thermoluminescent dosimeter ring.
- 8.4            Discuss what a radiation worker's dose limit is.
- 8.5            State what the role of the Nuclear Medicine Technologist is when a spill occurs.
- 8.6            Calculate inverse square law problems.
- 8.7            Explain how to use a Geiger Muller Counter and Dose Calibrator.
- 8.8            Discuss how the Nuclear Medicine Technologist limits their exposure while handling radioactivity.
- 8.9            State how to handle a syringe shield and lead pig.

**Common Course Number: NMT 1002****Unit 9      Medical Terminology*****General Outcome:***

- 9.0    The student shall be able to accurately state common medical terminology and body positioning terms used in the healthcare field.

***Specific Learning Outcomes***

Upon successful completion of this unit, the student should be able to:

- 9.1            Define Sagittal, Transverse, and Coronal Body Planes.
- 9.2            Define common root words used in healthcare.
- 9.3            Define common prefixes and suffixes used in healthcare.
- 9.4            Properly define words by breaking them down into prefixes, roots and/or suffixes.
- 9.5            Assemble medical terms by combining prefixes, roots and/or suffixes.
- 9.6            Define and demonstrate body positioning terminology such as Posterior, Anterior, Superior, Inferior, Lateral, Anterior Obliques, and Posterior Obliques.

**Common Course Number: NMT 1002****Unit 10 Instrumentation and Quality Control*****General Outcome:***

- 10.0 The student shall be able to accurately describe the commonly performed quality control procedures and also an understanding of the fundamentals of the gamma camera.

***Specific Learning Outcomes***

Upon successful completion of this unit, the student should be able to:

- 10.1 Locate and define the function of a:
- a. Collimator
  - b. Crystal
  - c. Septa
  - d. P-scope
  - e. Gantry
  - f. Other
- 10.2 Recognize how to properly perform a uniformity flood on a gamma camera.
- 10.3 Differentiate an extrinsic from an intrinsic flood.
- 10.4 State the purpose of a constancy test on a dose calibrator.
- 10.5 State the purpose of a wipe test.
- 10.6 State the purpose of an area survey.

**Common Course Number: NMT 1002****Unit 11 Common Nuclear Medicine Procedures*****General Outcome:***

- 11.0 The student shall be able to successfully demonstrate how to perform the most commonly performed nuclear medicine procedures.

***Specific Learning Outcomes***

Upon successful completion of this unit, the student should be able to:

- 11.1 State the basic steps on how to successfully perform a Whole Body Bone scan.
- 11.2 State the basic steps on how to successfully perform a Three Phase Bone scan.
- 11.3 State the basic steps on how to successfully perform a Hepatobiliary scan.
- 11.4 State the basic steps on how to successfully perform a Liver/Spleen scan.
- 11.5 State the basic steps on how to successfully perform a Gastrointestinal Bleeding scan.
- 11.6 State the basic steps on how to successfully perform a Gastric Emptying scan.
- 11.7 State the basic steps on how to successfully perform a Lung scan.
- 11.8 State the basic steps on how to successfully perform an Infection scan.
- 11.9 State the basic steps on how to successfully perform a renal scan.
- 11.10 State the basic steps on how to successfully perform a Thyroid uptake and scan.
- 11.11 State the basic steps on how to successfully perform a Cardiac scan.