

APPLICATION FOR CHANGE IN EXISTING COURSE: MAJOR & MINOR

1. Submitted by Lexington Community College Date 10-10-03

Department/Division offering course  
Nuclear Medicine Technology / Natural Science & Health Technologies Division

2. Changes proposed:

(a) Present prefix and number NMT 140 proposed prefix and number No change

(b) Present Title Nuclear Medicine Technology I

New Title no change

(c) If course title is changed and exceeds 24 characters (including spaces), include a sensible title (not to exceed 24 characters) for use on transcripts:

No change

(d) Present credits: 5 Proposed credits: 6

(e) Current lecture:laboratory ratio 1:6 Proposed: 1:6

(f) Effective Date of Change: (Semester & Year) Fall 2004

3. To be Cross-listed as NA NA  
(Prefix and Number) (Signature: Dept. Chair)

4. Proposed change in Bulletin description:

(a) Present description (including prerequisite(s):

NMT 140 Nuclear Medicine Technology I (5)

An introduction to nuclear medicine technology, the applied science and mathematics of radionuclides, and radionuclide skeletal and pulmonary imaging procedures are studied. Lecture: 3 hours, laboratory: 12 hours. Prerequisite: Admission to NMT program, CPR certification, BSL 110, BSL 111, MA 109; concurrent: CHE 104 and computer literacy course.

(b) New description:

NMT 140 Nuclear Medicine Technology I (6)

An introduction and orientation to nuclear medicine technology, aspects of radiation protection, the applied science and mathematics of radionuclides, and radionuclide skeletal imaging procedures are studied. Lecture: 4 hours, clinic: 12 hours.

(c) Prerequisite(s) for course as changed: Admission to NMT program, CPR certification, BSL 110, BSL 111, MA 109; concurrent: CHE 104 and PH 172.

5. What has prompted this proposal?

There are three major reasons for revising the NMT curriculum. (1) The last revision of this curriculum was implemented in 1995. (2) The Academic Committee of the Society of Nuclear Medicine Technologist Section published a revised Curriculum Guide in early 2003 to assist programs to update curriculum content. (3) The Nuclear Medicine Technology Certification Board has published revised competencies and will finish a revision of the examination matrix in 2004.

Since the time this course was created, there have been significant changes in the way the first-semester students are oriented and incorporated into the clinic assignments. Also, it was soon discovered after the last revision that not enough lecture time had been scheduled for topics related to clinical assignments and patient care issues in addition to patient imaging topics which are most relevant to the students' clinical assignments. In practice, some clinical time has been used to accommodate the lecture topics. This revision is intended to make the lecture and clinical time more accurately reflect the students' lecture and clinical assignment times.

The rationale for the request to change the lecture:laboratory ratio for this course is that the entry-level students are only beginning the clinical education aspect in this curriculum. To equate the contact-to-credit ratio in the first course with that of later courses is not fair to the student. A lower ratio in this introductory course is more reasonable in relation to the time spent in clinic, the course requirements, and the credit earned.

6. If there are to be significant changes in the content or teaching objectives of this course, indicate changes:

In the current course outline, the item "IV. Mathematics: Applied Technical Math" is being removed from this course and the individual topics will be incorporated into the appropriate courses/topics throughout the curriculum. This topic as a separate instructional unit has also been removed from the Curriculum Guide 2003 and relevant material integrated with clinical procedures. Teaching this as a separate topic has proved to be a series of very disjointed topics entirely out of context. For the past few years, these topics have been taught with the appropriate applications throughout the curriculum. This revision is to bring the curriculum of the program in line with the actual practice.

Even with the proposed additional 1 hour of lecture per week and the addition of radiation safety topics, the topic of radionuclide pulmonary imaging will be moved to another course so that sufficient time will be given to introductory topics as the student begins clinical assignments. The topic of radionuclide skeletal imaging will be retained in this course.

Current:

Upon completion of this course, the student can:

- A. describe the relationship of the nuclear medicine department to the organization of the hospital;
- B. describe interpersonal relationships with patients, peers, and other medical personnel;
- C. demonstrate patient management in the nuclear medicine department;
- D. organize and analyze data relevant to patient and department procedures;
- E. describe atomic and nuclear emissions common to radionuclides routinely used in nuclear medicine and matter/energy interactions basic to clinical instrumentation; and
- F. perform radionuclide imaging studies related to the skeletal system and pulmonary system under the supervision of a nuclear medicine technologist.

Proposed:

Upon completion of this course, the student can:

- A. demonstrate appropriate patient care in the nuclear medicine department;
- B. describe aspects of patient-technologist-peer relationship/communication;
- C. explain code of ethics, scope of practice, ethical and medicolegal aspects of nuclear medicine;
- D. describe the relationship of the nuclear medicine department to the organization of the hospital;

- E. explain and practice aspects of radiation safety in the nuclear medicine department;
- F. describe atomic and nuclear emissions common to radionuclides routinely used in nuclear medicine and matter/energy interactions basic to clinical instrumentation; and
- G. perform radionuclide imaging studies related to the skeletal system and pulmonary system under the supervision of a nuclear medicine technologist.

7 What other departments could be affected by the proposed change?

Nuclear Medicine Technology (NMT) has no dedicated classroom space in the college. Physics lab space (OB 331) and PHY lecture space (OB 319) are also used by NMT courses. The addition of 1 credit hour of lecture to 4 of the 5 NMT courses has the potential to overlap with PHY lecture and lab space. After contacting the Division Chair of the Physical Sciences and Engineering Technology Division and the Physics Area Coordinator, it appears that class room space will be available for additional NMT lecture assuming the PHY schedule of classes remains the same as 2002-2003. This will be addressed annually as Division Chairs schedule classroom space.

- 8. Will changing this course change the degree requirements in one or more programs?  
 No  Yes (If yes, attach an explanation of the change.)\*
- 9. Is this course currently included in the University Studies Program?  No  Yes (If yes, please attach correspondence indicating concurrence of the University Studies Committee.)
- 10. If the course is a 100-200 level course, please submit evidence (e.g. correspondence) that the Community College System has been consulted.

This course change has been forwarded to Aloris Owens, Nuclear Medicine Technology program coordinator, Jefferson Community College, and Dr. Carolyn O'Daniel, Executive Director for Academic Affairs at KCTCS.

- 11. Is this a minor change?  No  Yes (NOTE: See the description on this form of what constitutes a minor change. Minor changes are sent directly from the Dean of the College to the Chair of the Senate Council. If the latter deems the change not to be minor, it will be sent to the appropriate Council for normal processing.)
- 12. Within the Department, who should be consulted for further information on the proposed course change?

Name: Charles H Coulston, NMT Program Coordinator Phone Extension: 257-4872 x 4099

**APPLICATION FOR CHANGE IN EXISTING COURSE: MAJOR & MINOR**  
**Additional Information on CCS Forms**

1 Course Outline: (Two-level outline required)

***Current Course Outline***

Hospital Organization

- A. Functional Overview of the Hospital
- B. Patient Services
- C. Support Services
- D. Physical Organization of the Hospital
- E. Quality Management

II. Interpersonal Relationships and Medical Ethics

- A. Patient and Technologist Interactions
- B. Characteristics of the Patient/Technologist Relationship
- C. Medical Ethics
- D. Professional Issues
- E. Medicolegal Considerations

III. Patient Management

- A. Patient Communications
- B. Patient Handling
- C. Infection Control
- D. Patient Care

IV. Mathematics: Applied Technical Math

- A. Mathematical Units
- B. Decay Equation
- C. Attenuation Equation
- D. Graphs
- E. Statistics
- F. Nuclear Counting Statistics
- G. Information Representation
- H. Other Applications of Technical Mathematics
- I. Scientific Measurement

V. Atomic and Nuclear Physics

- A. Historical View of the Atom
- B. Structure of the Atom
- C. Radiation and the Atom
- D. Particulate Interactions with Matter
- E. Gamma and X ray Interaction with Matter
- F. Interaction Relationships

VI. Radionuclide Skeletal and Pulmonary Imaging Procedures

- A. Indication for Study
- B. Radiopharmaceutical
- C. Contraindications / Adverse Reactions
- D. Patient Preparation
- E. Equipment
- F. Procedure
- G. Alterations to / Interventions in the Procedure
- H. Scan Patterns (Image Analysis)

Signatures of Approval:

Department Chair: \_\_\_\_\_  
Dean of the College: \_\_\_\_\_



Date: 10-17-03

Date: 10-21-03

Date of Notice to the Faculty: \_\_\_\_\_

\*\*Undergraduate Council: \_\_\_\_\_ Date: \_\_\_\_\_

\*\*Graduate Council: \_\_\_\_\_ Date: \_\_\_\_\_

\*\*Academic Council for the Med. Ctr: \_\_\_\_\_ Date: \_\_\_\_\_

\*\*Senate Council: \_\_\_\_\_ Date of Notice to Univ. Senate: \_\_\_\_\_

ACTION OTHER THAN APPROVAL: \_\_\_\_\_

**\*NOTE:** Approval of this change will constitute approval of the program change unless other program modifications are proposed.

\*\*If applicable, as provided by the Rules of the University Senate.

The Minor Change route for courses is provided as a mechanism to make changes in existing courses and is limited to one or more of the following:

- a. change in number within the same hundred series;
- b. editorial change in description which does not imply change in content or emphasis;
- c. editorial change in title which does not imply change in content or emphasis;
- d. change in prerequisite which does not imply change in content or emphasis;
- e. crosslisting of courses under conditions set forth in item 3.0;
- f. correction of typographical errors. [University Senate Rules, Section III - 3.1]

## ***Proposed Course Outline***

### **Patient Care**

- A. Patient Communication and Interaction
- B. Verification, Identification, Assessment and Medical Records
- C. Patient Transportation and Safety
- D. Infection Control
- E. Patient Support
- F. Routes of Pharmaceutical Administration

### **II. Communications, Professionalism and Problem-solving**

- A. Interpersonal Relationships
- B. Patient-Technologist Relationships
- C. Professional Relationship
- D. Professional Issues
- E. Problem-solving and Troubleshooting

### **III. Ethics and Medicolegal Aspects of Health Care**

- A. Codes of Ethics
- B. Patient's Bill of Rights
- C. Patient Confidentiality and Privacy
- D. Scope of Practice and Standards of Practice
- E. Liability and Legal Issues
- F. Employer/Employee Responsibilities

### **IV. Health Care Delivery System**

- A. Historical Overview of Health Care Delivery
- B. Factors Affecting Economics of Health Care
- C. Health Care Delivery and Insurance Systems
- D. Hospital Economics and Organization
- E. Other Delivery Systems
- F. Current Trends and Issues
- G. How Consumers Affect the Health Care Delivery System
- H. Role of the Health Care Worker
- J. Future of Health Care

### **V. Aspects of Radiation Protection**

- A. Review of Basic Concepts
- B. Radiation Detectors and Monitors
- C. Personnel Monitoring
- D. Practical Methods of Radiation Exposure
- E. Radiation Safety Procedures
- F. Protection of the Patient
- G. Radioactive Materials Packages
- H. Waste Disposal Procedures and Regulations

### **VI. Nuclear Physics**

- A. Historical View of the Atom
- B. Structure of the Atom
- C. Radiation and the Atom
- D. Particulate Interactions with Matter
- E. Electromagnetic (Gamma & X Ray) Photon Interactions with Matter
- F. Attenuation and Transmission of Electromagnetic Photons

## VII. Skeletal Imaging

- A. Review Anatomy & Physiology
- B. Pathology
- C. Radiopharmaceuticals
- D. Contraindications and Adverse Reactions
- E. Patient Preparation
- F. Routine Planar Skeletal Imaging (limited and whole body)
- G. Planar (2-phase, 3-phase & 4-phase) Imaging
- H. SPECT
- I. Bone Densitometry / Absorptiometry

### 2. List of Experiments/Activities: (If laboratory or clinic is involved)

#### Current:

##### The student will:

- A. identify work areas, equipment, and supplies;
- B. practice patient/student technologist communications by role play and script writing;
- C. utilize patient medical records to identify physician orders and patient history;
- D. demonstrate proper body mechanics to transport and to transfer patients;
- E. demonstrate proper infection control and aseptic technique;
- F. demonstrate correct handling or monitoring of ancillary patient equipment;
- G. practice venipuncture techniques utilized to administer radiopharmaceuticals;
- H. position a classmate for various imaging procedures;
- I. develop and handle patient films properly;
- J. locate patient files in the nuclear medicine department;
- K. assay samples of radioactive materials correctly;
- L. calculate radioactive decay and patient dosages for specified amounts of activity;
- M. observe and record in a journal the performance of clinical activities and procedures related to the practice of a nuclear medicine technologist;
- N. assist the nuclear medicine technologist with skeletal system and pulmonary system radionuclide imaging procedures as well as to perform procedures under the direct supervision of the technologist.

#### Proposed:

##### The student will:

- A. identify work areas, equipment, and supplies in specified nuclear medicine departments;
- B. practice patient/student technologist communications by role play and script writing;
- C. utilize patient medical records to identify physician orders and patient history maintaining appropriate patient confidentiality;
- D. demonstrate proper body mechanics to transport and to transfer patients;
- F. demonstrate proper infection control and aseptic technique;
- G. demonstrate correct handling or monitoring of ancillary patient equipment;
- H. practice appropriate radiation protection;
- I. practice venipuncture techniques utilized to administer radiopharmaceuticals where permitted by clinical affiliate policy;
- J. develop and handle patient films properly;
- K. locate patient files in the nuclear medicine department;
- L. assay samples of radioactive materials correctly;
- M. calculate radioactive decay and patient dosages for specified amounts of activity;
- N. assist the nuclear medicine technologist with skeletal radionuclide imaging procedures as well as to perform procedures under the direct supervision of the technologist.

### 3. Changes in Suggested Learning Resources:

- Bernier, Donald R., Paul E. Christian, James K. Langan. *Nuclear Medicine: Technology and Techniques*, 4<sup>th</sup> ed. St Louis MO: Mosby-Year Book, Inc., 1997.
- Chandra, Ramesh. *Nuclear Medicine Physics: The Basics*, 5<sup>th</sup> ed. Baltimore, MD: Williams & Wilkins, 1998.
- Early, Paul J. and, D. Bruce Sodee. *Principles and Practice of Nuclear Medicine*, 2<sup>nd</sup> ed. St Louis MO: Mosby-Year Book, Inc., 1995.
- English, Robert J. *SPECT Single-Photon Emission Computed Tomography: A Primer*. Reston VA: The Society of Nuclear Medicine, 1995.
- Harkness, Beth, Paul Christian, Katherine L. Rowell. *Clinical Computers in Nuclear Medicine*. New York, NY: The Society of Nuclear Medicine - Technologist Section, 1992.
- Lee, Kai. *Computers in Nuclear Medicine: A Practical Approach*. New York, NY: The Society of Nuclear Medicine, 1991.
- Lombardi, Max H. *Radiation Safety in Nuclear Medicine*. Boca Raton FL: CRC Press, 1999.
- Mettler, Fred A., Jr. and Milton J. Guiberteau. *Essentials of Nuclear Medicine Imaging*, 4<sup>th</sup> ed. Philadelphia, PA: W.B. Saunders Company, 1998.
- Saha, Gopal B. *Fundamentals of Nuclear Pharmacy*, 4<sup>th</sup> ed. New York, NY: Springer, 1998.
- Tortorici, Marianne. *Administration of Imaging Pharmaceuticals*. Philadelphia, PA: W.B. Sanders Company, 1996.
- The Journal of Nuclear Medicine*. Reston, VA: The Society of Nuclear Medicine, Inc.
- The Journal of Nuclear Medicine Technology*. Reston, VA: The Society of Nuclear Medicine, Inc.
4. Impact of Change on Enrollment:
- No impact is expected.
5. For Inclusion on LCC General Education List: Not applicable
- A. Degree Area (AA/AS or AAS or both)
  - B. Competency Area
  - C. General Education Competency Statement (List and provide examples of implementation methods/activities)
  - D. Across the Curriculum Competencies (List and provide examples of implementation methods/activities)
6. For Removal from General Education List: Not applicable
- A. Competency Area
  - B. Rationale
7. For Inclusion on University Studies List: (A syllabus must be attached.) Not applicable
- A. Area
  - B. Course Competencies
  - C. Description of Writing Component

If a course has not been revised during the last five (5) years, the major change route must be used.