

APPLICATION FOR CHANGE IN EXISTING COURSE: MAJOR & MINOR

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

Department/Division offering course

Nuclear Medicine Technology / Natural Science & Health Technologies

2. Changes proposed:

(a) Present prefix and number NMT 280 Proposed prefix and number No change

(b) Present Title Nuclear Medicine Technology V

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: 8 Proposed credits: No change

(e) Current lecture:laboratory ratio 1:6 Proposed: No change

(f) Effective Date of Change: (Semester & Year) Spring 2006

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 280 Nuclear Medicine Technology V (8)

The biological effects of radiation, radioassay techniques and uncommonly performed imaging procedures are included in this course. Lecture: 3 hours, laboratory: 30 hours. Prerequisite: NMT 240.

(b) New description:

NMT 280 Nuclear Medicine Technology V (8)

The biological effects of radiation, regulatory aspects of radiation protection, oncologic / inflammatory-infectious process radionuclide imaging studies and hematologic and in-vitro radionuclide non-imaging studies are studied. Lecture 4 hours, clinic 24 hours.

(c) Prerequisite(s) for course as changed: NMT 240

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.

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

Radioassay has been removed from both the Curriculum Guide and the certification exam competencies. Also there are no local nuclear medicine departments that perform radioassay where students could have clinical assignments. This content has been deleted from the curriculum.

Uncommonly performed imaging studies have been integrated into the relevant organ system topics in this and previous courses rather than as a separate unit. The revision of the certification matrix has deleted some of the most obscure procedures and these have been removed from the curriculum.

Hematologic procedures are performed in only two clinical affiliates of this program and then only on rare occasions. This content has been moved to the final course so that it is one of the last topics the students study before taking the certification examination. Past graduates have stated that this was a helpful strategy.

Current:

Upon completion of this course, the student can:

- A. describe the biological effects of radiation exposure in relation to nuclear medicine;
- B. observe, assist, and perform radioassay procedures as available through clinical assignments;
- C. describe procedures for uncommonly performed imaging and nonimaging studies (CSF leak, CNS shunt patency, cardiac infarct-avid imaging, cardiac shunt evaluation, esophageal motility, gastroesophageal reflux, LeVeen shunt patency, Meckel's diverticulum imaging, salivary gland imaging, bone absorptiometry, bone marrow imaging, lymphoscintigraphy, plasma volume measurement); and
- D. perform both imaging and nonimaging diagnostic patient procedures as well as participate in therapeutic patient procedures as available under supervision of the nuclear medicine technologist or nuclear medicine physician.

Proposed:

Upon completion of this course, the student can:

- A. describe the biological effects of radiation exposure in relation to nuclear medicine;
- B. explain aspects of the regulations affecting the use of radioactive materials in nuclear medicine;
- C. perform radionuclide imaging studies related to oncologic / inflammatory-infectious processes under the supervision of a nuclear medicine technologist; and
- D. summarize, calculate and assist, as available, with selected hematologic and *in vitro* procedures.

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. (see attached)

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

Signatures of Approval:

Department Chair: _____

Date: 10-17-03

Dean of the College: _____

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]

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

1. Course Outline: (Two-level outline required)

Current Course Outline

Radiobiology

- A. Review of Cell Biology
- B. Interactions of Radiation and Matter
- C. Radiation Genetics
- D. Radiosensitivity and Cell Population
- E. Cellular Responses to Radiation
- F. Systemic Radiation Response
- G. In Utero Radiation Effects
- H. Late Effects of Radiation Exposure
- I. Critical Organ and Dose Calculations
- J. Risk-to-Benefits Ratio

II. Radioassay

- A. Introduction to Radioassay
- B. Introduction to Immunology
- C. Theory of Radioassay
- D. Non-radioactive Assays
- E. Radiolabeling
- F. Antibody Production for Assay Use
- G. Assay Reliability
- H. Separation Techniques
- I. Assay Techniques
- J. Quality Assurance of Radioassay Procedures
- K. Specific Assays

III. Uncommonly Performed Imaging and Nonimaging 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)

*(CSF leak, CNS shunt patency, cardiac infarct-avid imaging, cardiac shunt evaluation, esophageal motility, gastroesophageal reflux, LeVeen shunt patency, Meckel's diverticulum imaging, salivary gland imaging, bone absorptiometry, bone marrow imaging, lymphoscintigraphy, plasma volume measurement)

Proposed Course Outline

Radiobiology

- A. Review of Characteristics of Ionizing Radiation
- B. Sources of Radiation
- C. Measurement of Radiation and its Effects
- D. Review of Cell Biology
- E. Interaction of Radiation and Matter
- F. Radiation Genetics

- G. Cellular Responses to Radiation
 - H. Factors Affecting Cellular Response to Radiation
Radiosensitivity and Cell Populations
 - J. Tissue and Systemic Responses to Radiation
 - K. Effects of In Utero Irradiation
 - L. Late Effects of Radiation Exposure
 - M. Radiation Doses
 - N. Risk-to-Benefit Ratios
- II. Aspects of Radiation Protection
- A. Regulation of Radiation Exposure and Use of Radioactive Materials
 - B. Dose and Exposure Limit Recommendations and Regulations
 - C. Possession of Radioactive Materials
 - D. Institutional Oversight (NRC Regulations)
 - E. Radionuclide Therapy
 - F. NRC Rules and Regulations
- III. Oncology / Inflammatory-Infectious Process Imaging
- A. Review of Anatomy & Physiology
 - B. Pathology
 - C. Radiolabeled White Blood Cell Studies
 - D. Gallium-67 Imaging, Planar and SPECT
 - E. Radiolabeled-antibody Imaging
 - F. Radiolabeled-receptor Imaging
 - G. Scintimammography
 - H. Sentinel Lymph Node Imaging
 - I. Lymphoscintigraphy
 - J. PET Imaging for Oncology
 - K. ¹³¹I Whole Body Imaging
- IV. Hematology and In Vitro Procedures
- A. Review of Anatomy & Physiology
 - B. Pathology
 - C. Bone Marrow Imaging
 - D. Schilling (B-12 excretion) Test
 - E. Red Cell Mass Calculation
 - F. Total Blood Volume Calculation / Estimation
 - G. Plasma Volume Calculation / Estimation
 - H. Red Cell Survival Measurements
 - I. Red Cell Sequestration Measurements
 - J. Selective Splenic Imaging

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

Current Clinical Activities

The student will:

- A. relate principles of radiobiology to the practice of radiation safety;
- B. perform any routine diagnostic imaging or nonimaging patient procedure under the supervision by the nuclear medicine technologist; and
- C. assist with any therapeutic use of radionuclides under the direct supervision of the nuclear medicine technologist and physician.

Proposed Clinical Activities

The student will:

- A. relate principles of radiobiology to the practice of radiation safety;
- B. perform any routine diagnostic imaging or non-imaging patient procedure under the supervision by the nuclear medicine technologist; and
- C. assist and perform oncologic / inflammatory-infectious process imaging and hematologic / in-vitro radionuclide procedures under the direct supervision of the nuclear medicine technologist and physician.

3. Changes in Suggested Learning Resources:

Bernier, Donald R., Paul E. Christian, James K. Langan. *Nuclear Medicine: Technology and Techniques*, 4th ed. St Louis MO: Mosby-Year Book, Inc., 1997.

Chandra, Ramesh. *Nuclear Medicine Physics: The Basics*, 5th ed. Baltimore, MD: Williams & Wilkins, 1998.

Early, Paul J. and, D. Bruce Sodee. *Principles and Practice of Nuclear Medicine*, 2nd 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*, 4th ed. Philadelphia, PA: W.B. Saunders Company, 1998.

Saha, Gopal B. *Fundamentals of Nuclear Pharmacy*, 4th 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 anticipated

- 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.