

**I. CATALOG INFORMATION**

A. Discipline: RADIOLOGIC TECHNOLOGY (RADT)

B. Subject Code and Number: RADT M40

C. Course Title: Nuclear Medicine Practice II

D. Credit Course units:

Units: 3

Lecture Hours per week: 3

Lab Hours per week : 0

Variable Units : No

E. Student Learning Hours:

Lecture Hours:

Classroom hours: 52.5 - 52.5

Laboratory/Activity Hours:

Laboratory/Activity Hours 0 - 0

**Total Combined Hours** in a 17.5 week term: 52.5 - 52.5

F. Non-Credit Course hours per week \_\_\_\_\_

G. May be taken a total of:  1  2  3  4 time(s) for credit

H. Is the course co-designated (same as) another course: No  Yes

If YES, designate course Subject Code & Number: \_\_\_\_\_

I. Course Description:

Focuses on the equipment and radiopharmaceutical agents used to perform imaging procedures of the genitourinary, hematopoietic, respiratory systems. Includes in-vitro, oncology and inflammation imaging for the adult and pediatric populations.

J. Entrance Skills

\*Prerequisite: No  Yes  Course(s)

RADT M30

\*Corequisite: No  Yes  Course(s)

RADT M42 and RADT M44A

Limitation on Enrollment: No  Yes

\_\_\_\_\_

Recommended Preparation: No  Yes  Course(s)

\_\_\_\_\_

Other: No  Yes

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## K. Other Catalog Information:

## II. COURSE OBJECTIVES

Upon successful completion of the course, a student will be able to:

		<b>Methods of evaluation will be consistent with, but not limited by, the following types or examples.</b>
1	name the basic nuclear medicine procedures included in this course.	Quiz, test
2	list and describe the nuclear medicine terms for procedures involving the genitourinary, hematology, and respiratory systems.	Quiz, test
3	describe gross anatomy and function for genitourinary, hematology, and respiratory systems.	Quiz, test
4	identify structures seen on nuclear medicine images of the genitourinary, hematology, and respiratory systems.	Quiz, test
5	describe the radiopharmaceuticals used for imaging of the genitourinary, hematology, and respiratory systems, including their physical and chemical properties, biorouting, route and method of administration.	Quiz, test
6	discuss the advantages and disadvantages of each radiopharmaceutical agent used in genitourinary, hematology, respiratory systems, and pediatric procedures.	Quiz, test
7	specify the radiation dose range for imaging agents used in the imaging of genitourinary, hematology, respiratory systems, and pediatric procedures and discuss the resulting radiation dose to the various organs and tissues.	Quiz, test
8	discuss any physical or pathological conditions, prior procedures, or medications that could contraindicate or interfere with imaging of the genitourinary, hematology, and respiratory systems.	Quiz, test
9	describe any precautions that should be taken and any potential adverse reactions to the radiopharmaceuticals used while imaging the genitourinary, hematology, and respiratory systems.	Quiz, test
10	describe the preparation of the patient for each procedure of the genitourinary, hematology, and respiratory systems.	Quiz, test
11	describe the procedures for routine imaging of genitourinary, hematology, oncology/ inflammation, respiratory systems, and pediatric procedures, including equipment, protocol, dose and administration techniques.	Quiz, test, presentation
12	describe the appearance of various pathologies seen on nuclear medicine images of the genitourinary, hematology, and respiratory systems.	Quiz, test, presentation

## III. COURSE CONTENT

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Estimated %	Topic	Learning Outcomes
<b>Lecture</b> (must total 100%)		
15.00%	Nuclear medicine procedures of the genitourinary system	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
10.00%	Nuclear medicine procedures of the hematology system	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
25.00%	Oncology/inflammation imaging of the genitourinary, hematology, and respiratory systems	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
25.00%	Nuclear medicine procedures of the respiratory systems	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
10.00%	Nuclear medicine pediatric procedures of the genitourinary, hematology, and respiratory systems	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
15.00%	Nuclear medicine in-vitro procedures of the genitourinary, hematology, and respiratory systems	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

#### IV. TYPICAL ASSIGNMENTS

##### A. Writing assignments

Writing assignments are required. Possible assignments may include, but are not limited to:

1	written assignments in workbook manual.
2	written short essay questions on quizzes and exams.

##### B. Appropriate outside assignments

Appropriate outside assignments are required. Possible assignments may include, but are not limited to:

1	assigned readings from professional nuclear medicine journals.
2	online research and assignments.

##### C. Critical thinking assignments

Critical thinking assignments are required. Possible assignments may include, but are not limited to:

1	term paper demonstrating the different pharmaceuticals comparing adult and pediatric procedures.
2	student presentation of an exam with pathology explaining and comparing an adult and pediatric procedure.

#### V. METHODS OF INSTRUCTION

Methods of instruction may include, but are not limited to:

- Distance Education – When any portion of class contact hours is replaced by distance education delivery mode (Complete DE Addendum, Section XV)
- Lecture/Discussion
- Laboratory/Activity
- Other (Specify) Instructor-led video discussions.
- Optional Field Trips
- Required Field Trips

**VI. METHODS OF EVALUATION**

Methods of evaluation may include, but are not limited to:

- Essay Exam
- Classroom Discussion
- Skill Demonstration
- Problem Solving Exam
- Reports/Papers/Journals
- Participation
- Objective Exams
- Projects
- Other (specify)

Students will be evaluated through problem solving, objective, and essay exams, research papers, classroom discussion and participation.

**VII. REPRESENTATIVE TEXTS AND OTHER COURSE MATERIALS**

Christian, Paul, and Kristen Waterstram-Rich. Nuclear Medicine and PET/CT: Technology and Techniques. 7th ed. Mosby, 2011.

Shackett, Pete. Nuclear Medicine Technology: Procedures and Quick Reference. 2nd ed. Lippincott, Williams and Wilkins, 2009.

**VIII. STUDENT MATERIALS FEES**

- No  Yes

**IX. PARALLEL COURSES**

<i>College</i>	<i>Course Number</i>	<i>Course Title</i>	<i>Units</i>
No comparable community college course in the state of California.			

**X. MINIMUM QUALIFICATIONS**

**Courses in Disciplines in which Masters Degrees are not expected:**  
 Licensure in Nuclear Medicine Technology plus bachelor's degree and two years experience or associate's degree and six years experience in nuclear medicine technology.

**XI. ARTICULATION INFORMATION**

A. Title V Course Classification:

1. This course is designed to be taken either:

- Pass/No Pass only (no letter grade possible); or
- Letter grade (P/NP possible at student option)

2. Degree status:

- Either  Associate Degree Applicable; or  Non-associate Degree Applicable

B. Moorpark College General Education:

1. Do you recommend this course for inclusion on the Associate Degree General Education list?

Yes:  No:  If YES, what section(s)?

- A1 - Natural Sciences - Biological Science
- A2 - Natural Sciences - Physical Science
- B1 - Social and Behavioral Sciences - American History/Institutions
- B2 - Social and Behavioral Sciences - Other Social Behavioral Science
- C1 - Humanities - Fine or Performing Arts
- C2 - Humanities - Other Humanities
- D1 - Language and Rationality - English Composition
- D2 - Language and Rationality - Communication and Analytical Thinking
- E1 - Health/Physical Education
- E2 - PE or Dance
- F - Ethnic/Gender Studies

C. California State University(CSU) Articulation:

1. Do you recommend this course for transfer credit to CSU? Yes:  No:

2. If YES do you recommend this course for inclusion on the CSU General Education list?

Yes:  No:  If YES, which area(s)?

- |                             |                             |                             |                             |                             |                              |                             |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|------------------------------|-----------------------------|
| A1 <input type="checkbox"/> | A2 <input type="checkbox"/> | A3 <input type="checkbox"/> | B1 <input type="checkbox"/> | B2 <input type="checkbox"/> | B3 <input type="checkbox"/>  | B4 <input type="checkbox"/> |
| C1 <input type="checkbox"/> | C2 <input type="checkbox"/> | D1 <input type="checkbox"/> | D2 <input type="checkbox"/> | D3 <input type="checkbox"/> | D4 <input type="checkbox"/>  | D5 <input type="checkbox"/> |
| <input type="checkbox"/>    | D6 <input type="checkbox"/> | D7 <input type="checkbox"/> | D8 <input type="checkbox"/> | D9 <input type="checkbox"/> | D10 <input type="checkbox"/> | E <input type="checkbox"/>  |

D. University of California (UC) Articulation:

1. Do you recommend this course for transfer to the UC? Yes:  No:

2. If YES do you recommend this course for the Intersegmental General Education Transfer Curriculum (IGETC)? Yes:  No:

IGETC Area 1: English Communication

- English Composition
- Critical Thinking-English Composition
- Oral Communication

IGETC Area 2: Mathematical Concepts and Quantitative Reasoning

- Mathematical Concepts

IGETC Area 3: Arts and Humanities

- Arts
- Humanities

IGETC Area 4: Social and Behavioral Sciences

- Anthropology and Archaeology
- Economics
- Ethnic Studies
- Gender Studies
- Geography
- History
- Interdisciplinary, Social & Behavioral Sciences
- Political Science, Government & Legal Institutions
- Psychology
- Sociology & Criminology

IGETC Area 5: Physical and Biological Sciences (mark all that apply)

- Physical Science Lab or Physical Science Lab only (non-sequence)
- Physical Science Lecture only (non-sequence)
- Biological Science
- Physical Science Courses
- Physical Science Lab or Biological Science Lab Only (non-sequence)
- Biological Science Courses
- Biological Science Lab course
- First Science course in a Special sequence
- Second Science course in a Special Sequence
- Laboratory Activity
- Physical Sciences

IGETC Area 6: Language other than English

- Languages other than English (UC Requirement Only)
- U.S. History, Constitution, and American Ideals (CSU Requirement ONLY)
- U.S. History, Constitution, and American Ideals (CSU

Requirement ONLY)

**XII. REVIEW OF LIBRARY RESOURCES**

- A. What planned assignment(s) will require library resources and use?

The following assignments require library resources:

Term papers involving research using the Library's print and online resources.

- B. Are the currently held library resources sufficient to support the course assignment?

YES:  NO:

If NO, please list additional library resources needed to support this course.

**XIII. PREREQUISITE AND/OR COREQUISITE JUSTIFICATION**

Requisite Justification for RADT M30

- A. Sequential course within a discipline.

1. describe the purpose of nuclear medicine in relation to health care.

2. list and explain the terms employed in nuclear medicine.

3. list the basic nuclear medicine procedures performed in the bone, cardiovascular, central nervous, digestive and endocrine/exocrine systems.

4. describe gross anatomy and function for bone, cardiovascular, central nervous, digestive, and endocrine/exocrine systems.

5. identify structures seen on nuclear medicine images.

6. describe the radiopharmaceuticals used for imaging the bone, cardiovascular, central nervous, digestive, endocrine/exocrine systems including their physical and chemical properties, biorouting, route and method of administration.

7. discuss the advantages and disadvantages of each radiopharmaceutical agent for bone, cardiovascular, central nervous, digestive, and endocrine/exocrine procedures.

8. calculate the dose range for imaging agents and discuss the effects on various organs and tissues.

9. discuss dose preparation and any special precautions that should be taken to assure quality imaging agents when conducting exams of the bone, cardiovascular, central nervous, digestive, and endocrine/exocrine systems.

10. discuss any physical or pathological conditions, prior procedures, or medications that could contraindicate or interfere with nuclear medicine imaging.

11. describe any precautions that should be taken and any potential adverse reactions to the radiopharmaceuticals.

12. describe the preparation of the patient for each procedure.

13. list the indications for each procedure and discuss why a nuclear medicine study would be preferable or complement other diagnostic modalities in various cases.

14. describe the procedures for routine imaging of bone, cardiovascular, central nervous, digestive, and endocrine/exocrine systems, including equipment, protocol, dose and administration technique, administration-to-acquisition times, acquisition parameters, standard positioning and views, special imaging adaptations, image formatting and potential pitfalls.

15. describe the appearance of various pathologies seen on nuclear medicine scans of bone, cardiovascular, central nervous, digestive, and endocrine/exocrine systems.

- B. Standard Prerequisite or Corequisite required by universities.
- C. Corequisite is linked to companion lecture course.
- D. Prerequisite or Corequisite is authorized by legal statute or regulation.  
Code Section: \_\_\_\_\_
- E. Prerequisite or Corequisite is necessary to protect the students' health and safety.
- F. Computation or communication skill is needed.
- G. Performance courses: Audition, portfolio, tryouts, etc. needed.

Requisite Justification for RADT M42

- A. Sequential course within a discipline.
- B. Standard Prerequisite or Corequisite required by universities.
- C. Corequisite is linked to companion lecture course.
- D. Prerequisite or Corequisite is authorized by legal statute or regulation.  
Code Section: \_\_\_\_\_
- E. Prerequisite or Corequisite is necessary to protect the students' health and safety.
- F. Computation or communication skill is needed.



G. Performance courses: Audition, portfolio, tryouts, etc. needed.

and

Requisite Justification for RADT M44A

A. Sequential course within a discipline.

B. Standard Prerequisite or Corequisite required by universities.

C. Corequisite is linked to companion lecture course.

D. Prerequisite or Corequisite is authorized by legal statute or regulation.  
Code Section: \_\_\_\_\_

E. Prerequisite or Corequisite is necessary to protect the students' health and safety.

F. Computation or communication skill is needed.

G. Performance courses: Audition, portfolio, tryouts, etc. needed.

#### **XIV. WORKPLACE PREPARATION**

Required for career technical courses only. A career technical course/program is one with the primary goal to prepare students for employment immediately upon course/program completion, and/or upgrading employment skills.

Detail how the course meets the Secretary of Labors Commission on the Achievement of Necessary Skills (SCANS) areas. (For a description of the competencies and skills with a listing of what students should be able to do, go to:

<http://www.ncrel.org/sdrs/areas/issues/methods/assment/as7scans.htm>)

The course will address the SCANS competency areas:

1. Resources: the students will identify weekly learning objectives; devise a plan to allocate adequate study time to learn the weekly objectives; learn to organize the steps involved in nuclear medicine procedures; identify available resources in the Health Sciences Department and college campus to assist in meeting their learning objectives; meet assignment deadlines and be prepared to participate in class discussions.
2. Interpersonal: the students will work in collaboration with other students to bring nuclear medicine images from the clinical setting and present case studies to strengthen the skills of each member of the class and help gain clinical proficiency; experience the importance of collaboration and of being a team player in the health care field and to reinforce skills of relating to a diverse population.

3. Information: the students will refer to nuclear medicine radiopharmaceutical charts to select the dose range for imaging agents for the body part of interest; use computers in the skills lab, which prepares them to evaluate, organize and communicate information in the clinical facility; make use of professional health care and radiography journals to keep abreast of the state-of-the-art advances in medical imaging and to stay current with continuing education requirements.
4. Systems: the students will follow hospital protocols for each exam; identify when a change in protocols is needed and communicate this to the supervising technologist for approval; demonstrate skill when entering patient data for documentation and billing purposes.
5. Technology: the students will demonstrate skill when operating nuclear medicine equipment; be able to problem shoot equipment when needed; be proficient when operating hospital PACS (picture archiving communication system) and RIS (radiology information system).

The course also addresses the SCANS skills and personal qualities:

1. Basic Skills: the students will read professional journals and manuals related to new nuclear medicine procedures and equipment.
2. Thinking Skills: the students will describe how to alter nuclear medicine procedures for the pediatric, geriatric, and trauma patients; and describe how to prioritize nuclear medicine procedures when there are multiple procedures ordered.
3. Personal Qualities: the students will demonstrate accountability through regular attendance and punctuality in class; demonstrate reliability by completing assignments as instructed and in a timely manner; show respect for each other, others with whom they come in contact, and those in authority.

## **XV. DISTANCE LEARNING COURSE OUTLINE ADDENDUM**

### 1. Mode of Delivery

- Online (course will be delivered 100% online)
- Online with onsite examinations (100% of the instruction will occur online, but examinations and an orientation will be scheduled onsite)
- Online/Hybrid (a percentage of instruction will be held online and the remaining percentage of instruction will be held onsite)
- Lab activities will be conducted onsite
- Televideo (Examinations and an orientation will be held onsite)
- Teleconference
- Other

### 2. Need/Justification

Improve general student access.

- ### 3. Describe how instructors teaching this course will ensure regular, effective contact with and among students.

Online instructors will provide lesson plans that require activities such as reading course material from a mandatory textbook and participating in discussion forums or chat room topics. Instructors may also meet with students for study sessions and online office hours using an online communication tool. Instructors will provide students with feedback on the content and quality of assignments and discussion posts. Additionally, instructors may engage students using the following communication activities available in the online classroom: contact students via e-mail within the course shell, by campus e-mail, and/or MyVCCCD; use the "announcement" tool to remind students of important assignments and due dates; provide students with an online schedule of class events using the "calendar" tool in the online course shell.

4. Describe how instructors teaching this course will involve students in active learning.

Instructors may involve students in active learning with the following activities: students may view video lessons and/or text-based lessons corresponding to course content and learning objectives; students may complete homework through the online course, and/or using an interactive online homework system provided by a publishing company; students may engage in internet searches and Library online database resources on topics corresponding to course content and learning objectives; students may test their knowledge with interactive online quizzes; students may interact with the instructor and classmates using an online discussion forum to ask questions; students may submit questions to the instructor by email or ask in person in a virtual classroom; instructor may create student groups or group activities using the online course.

5. Explain how instructors teaching this course will provide multiple methods of content representation.

The following represent the methods by which content may be provided for learning: instructional videos; textbook and professional journals; links to online resources that may include videos, quizzes, text explanations and extensions, and primary documents, and homework assignments.

6. Describe how instructors teaching this course will evaluate student performance.

Students may take objective and essay exams in an online teaching environment. Students may be required to do the following assignments: complete reflective writing assignments focused on application of course content; develop, implement, and evaluate projects; complete regular online quizzes; complete written assignments related to key course concepts; participate in online discussion forums.

## **XVI. GENERAL EDUCATION COURSE OUTLINE ADDENDUM**

RADT M40: Not Applicable

## **XVII. STUDENT MATERIALS FEE ADDENDUM**

RADT M40: Not Applicable

## **XVIII. REPEATABILITY JUSTIFICATION TITLE 5, SECTION 55041**

RADT M40: Not Applicable

## **XIX. CURRICULUM APPROVAL**

Course Information:

Discipline: RADIOLOGIC TECHNOLOGY (RADT)

Discipline Code and Number: RADT M40

Course Revision Category: Technical Course Revision

Course Proposed By:

Originating Faculty Guadalupe Aldana 03/14/2014

Faculty Peer: Guadalupe Aldana 03/18/2014

Curriculum Rep: Robert Darwin 03/21/2014

Department Chair: Carol Higashida 03/17/2014

Division Dean: Kimberly Hoffmans 03/18/2014

Approved By:

Curriculum Chair: Jerry Mansfield 05/20/2014

Executive Vice President: Lori Bennett 05/20/2014

Articulation Officer: Letrisha Mai 05/01/2014

Librarian: Mary LaBarge 04/29/2014

Implementation Term and Year: Fall 2014

Approval Dates:

Approved by Moorpark College Curriculum Committee: 05/06/2014

Approved by Board of Trustees (if applicable): \_\_\_\_\_

Approved by State (if applicable): \_\_\_\_\_