

I. CATALOG INFORMATIONA. Discipline: RADIOLOGIC TECHNOLOGY (RADT)B. Subject Code and Number: RADT M42C. Course Title: Principles of Nuclear Medicine II

D. Credit Course units:

Units: 3Lecture Hours per week: 3Lab Hours per week : 0Variable 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 creditH. Is the course co-designated (same as) another course: No Yes
If YES, designate course Subject Code & Number: _____

I. Course Description:

Focuses on patient care, radiation safety, and principles of single photon emission computed tomography (SPECT). Includes introduction to positron emission tomography (PET) instrumentation, and positron emission tomography/computed tomography (PET/CT) oncology.

J. Entrance Skills

*Prerequisite: No Yes Course(s)
RADT M32*Corequisite: No Yes Course(s)
RADT M40 and RADT M44ALimitation on Enrollment: No Yes
_____Recommended Preparation: No Yes Course(s)
_____Other: No Yes

K. Other Catalog Information:

II. COURSE OBJECTIVES

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

		Methods of evaluation will be consistent with, but not limited by, the following types or examples.
1	evaluate patient's medical history to understand and relate to the patient's illness and the pending diagnostic or therapeutic procedure	Quizzes and exams.
2	determine the appropriate sequence for executing multiple procedures.	Quizzes and exams.
3	define local, state and federal regulations in order to maintain compliance with all agencies.	Quizzes and exams.
4	follow proper protection procedures thereby limiting the radiation exposure to the patient, fellow workers, and self.	Quizzes and exams.
5	practice decontamination procedures and follow all state and federal regulations for disposing of radioactive waste.	Quizzes and exams.
6	evaluate the performance of scintillation cameras and probes.	Quizzes and exams.
7	prepare and verify quality of radiopharmaceuticals under the direction of an authorized user.	Quizzes and exams.
8	assist an authorized user in the preparation and application of therapeutic radionuclides for SPECT/CT, PET, and PET/CT procedures.	Quizzes and exams.
9	perform and evaluate quality control procedures for a SPECT camera.	Quizzes and exams.
10	evaluate and discuss theories and practice of radiopharmacy, including preparation, calculations of the dose to be administered, quality control, radiation safety, and applicable regulations.	Quizzes, research paper and exams.

III. COURSE CONTENT

Estimated %	Topic	Learning Outcomes
Lecture (must total 100%)		
20.00%	Advanced radiochemistry and radiopharmacology of nuclear medicine.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
		1, 2, 3, 4,

20.00%	Patient Care and quality improvement (QI) in nuclear medicine	4, 5, 5, 6, 6, 7, 7, 8, 8, 9, 9, 10, 10
20.00%	Principles of SPECT and SPECT/CT	1, 2, 3, 6, 9, 10
10.00%	PET Instrumentation	1, 2, 3, 6, 9, 10
10.00%	Clinical PET/CT oncology	1, 2, 3, 4, 5, 6, 8, 10
20.00%	Radiation safety during SPECT, SPECT/CT, PET, and PET/CT procedures	1, 2, 3, 4, 5, 6, 7, 8, 9, 10

IV. TYPICAL ASSIGNMENTS

A. Writing assignments

Writing assignments are required. Possible assignments may include, but are not limited to:	
1	written papers on PET/PETCT.
2	written answers to discussion questions in the text.
3	essay questions on 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	Internet research on radiation safety.

C. Critical thinking assignments

Critical thinking assignments are required. Possible assignments may include, but are not limited to:	
1	analyze written information presented on PET/PETCT and relate to patient dose and protection protocols.
2	case study presentation which includes amounts of radioisotopes used for the particular patient.
3	draw a hotlab layout which considers safety and efficiency protocols.

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 discussions on patient care, radiation safety, and principles of basic

nuclear medicine procedures.

Optional Field Trips

Required Field Trips

VI. METHODS OF EVALUATION

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

- | | | |
|--|---|---|
| <input checked="" type="checkbox"/> Essay Exam | <input checked="" type="checkbox"/> Classroom Discussion | <input type="checkbox"/> Skill Demonstration |
| <input checked="" type="checkbox"/> Problem Solving Exam | <input checked="" type="checkbox"/> Reports/Papers/Journals | <input checked="" type="checkbox"/> Participation |
| <input checked="" type="checkbox"/> Objective Exams | <input checked="" type="checkbox"/> Projects | <input checked="" type="checkbox"/> 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 A2 A3 B1 B2 B3 B4
- C1 C2 D1 D2 D3 D4 D5
- D6 D7 D8 D9 D10 E

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:

Reading assignments using the Library's print and online resources and the use of course reserve materials. Research using the Library's specialized health and medical databases on subjects concerning nuclear medicine.

- 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 M32

A. Sequential course within a discipline.

1. describe the general atomic structure of an atom and atomic response to radiation.
2. describe the characteristics of gamma, x-ray, beta, and alpha radiation and the body's response to each.
3. discuss dose and exposure limit recommendations and regulations for technologist, patients, and the general public.
4. describe the various types of nuclear medicine instruments used in imaging and non-imaging procedures.
5. discuss the radiation protection programs and regulations that apply to personnel, patients, radioactive materials, waste disposal, and contamination.
6. perform statistical calculations and differentiate between a Poisson and Gaussian distribution.
7. discuss use and quality control of the various types of imaging systems used for gamma and positron imaging.
8. describe the operation for non-imaging instruments including monitoring equipment, dose calibrators, well counters, uptake probes, liquid scintillation systems, and the gamma probe.
9. discuss the configuration, functions, and application of computers in nuclear medicine.
10. evaluate and discuss theories and practice of radiopharmacy, including preparation, calculations of the dose to be administered, quality control, radiation safety, and applicable regulations.

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 M40

- 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 imaging procedures; identify resources available 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 experience the importance of being a team player in the health care field and to reinforce skills relating to a diverse population; and bring and present case studies from clinical setting to strengthen the skills of each member of the class and help gain clinical proficiency.
3. **Information:** the students will refer to charts to select the correct amount of radioisotopes for imaging the body part of interest; use computers in the skills lab which prepares them to evaluate, organize and communicate information in the clinical facility; and make use of professional health care and imaging 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; and 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 trouble shoot equipment when needed; and be proficient when operating hospital PACS (picture archiving and 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 imaging techniques and equipment.
2. **Thinking Skills:** the students will describe how to alter nuclear medicine procedures for the pediatric, and geriatric, 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 M42: Not Applicable

XVII. STUDENT MATERIALS FEE ADDENDUM

RADT M42: Not Applicable

XVIII. REPEATABILITY JUSTIFICATION TITLE 5, SECTION 55041

RADT M42: Not Applicable

XIX. CURRICULUM APPROVAL

Course Information:

Discipline: RADIOLOGIC TECHNOLOGY (RADT)

Discipline Code and Number: RADT M42

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): _____