

I. CATALOG INFORMATIONA. Discipline: RADIOLOGIC TECHNOLOGY (RADT)B. Subject Code and Number: RADT M01BC. Course Title: Radiographic Technique I

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:

Covers production of radiation and interactions with matter. Includes manipulation and image quality of radiographic equipment.

J. Entrance Skills

*Prerequisite: No Yes Course(s)
RADT M10A and RADT M10AL and RADT M10B*Corequisite: No Yes Course(s)
RADT M01A and RADT M01AL and RADT M01BL and RADT M11Limitation 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	identify the different types of x-ray equipment including diagnostic and fluoroscopic.	Quiz Exam
2	define the function of each of the tube parts and their influence on radiographic technique.	Quiz Exam
3	describe the production of Bremss (Bremsstrahlung) and characteristic radiation.	Quiz Exam
4	discuss various photon interactions with matter by describing the interaction, relation to atomic number, photon energy and part density, and their applications in diagnostic radiology.	Quiz Exam
5	discuss the clinical significance of the photoelectric and modified scattering interactions in diagnostic imaging.	Quiz Exam
6	list the various component parts of the x-ray recording system for digital departments.	Quiz Exam
7	discuss the fundamentals of digital radiography, distinguishing between cassette-based systems and cassette-less systems.	Quiz Exam
8	discuss digital image formation.	Quiz Exam
9	discuss grids and their use in a digital department.	Quiz Exam
10	describe the various types of image receptor holders and their use.	Quiz Exam
11	discuss practical considerations in setting standards for acceptable image quality.	Quiz Exam

III. COURSE CONTENT

Estimated %	Topic	Learning Outcomes
Lecture (must total 100%)		
8.00%	X-rays	1, 3, 4, 5
10.00%	The x-ray machines	1, 2, 3, 4, 5, 6, 7
11.00%	Production of x-rays	2, 3, 4, 5
10.00%	Interaction of x-rays with matter	4, 5, 8, 9, 11
2.00%	Filtration	2, 4, 5, 6, 11
2.00%	Beam restrictors	1, 2, 4, 5, 6, 11
6.00%	Contrast	4, 6, 7, 8, 9, 10, 11
6.00%	Distortion	6, 7, 8, 10, 11
14.00%	Photostimulable plates (PSP plates)	4, 5, 6, 7, 8, 10, 11
5.00%	Grids	5, 6, 9, 11
6.00%	Brightness	6, 7, 8, 9, 10, 11
6.00%	Spatial resolution	6, 7, 8, 10, 11
14.00%	Digital detectors	2, 4, 5, 6, 7, 8, 9, 10, 11

IV. TYPICAL ASSIGNMENTS**A. Writing assignments**

Writing assignments are required. Possible assignments may include, but are not limited to:	
1	write essay questions on exams.
2	write answers to objectives for each lecture.
3	write a short paper that describes the various types of image receptor holders and their uses.
4	write answers to discussion questions in the text.

B. Appropriate outside assignments

Appropriate outside assignments are required. Possible assignments may include, but are not limited to:	
1	perform Internet-based reading and exams from Mosby's Radiography Online: Radiologic Physics; latest edition.
2	perform library and Internet research on Digital Radiography.
3	assigned readings from text and professional journals.

C. Critical thinking assignments

Critical thinking assignments are required. Possible assignments may include, but are not limited to:	
1	differentiate between a cassette-based system and a computer-based system.
2	evaluate images for quality and assess and propose needed changes.
3	calculate the energy of an x-ray when the wavelength is given.

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) Group projects, discussion/seminar, computer-assisted instruction
- 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)

weekly quizzes

VII. REPRESENTATIVE TEXTS AND OTHER COURSE MATERIALS

Bushong, Stewart. Radiologic Science for Technologists: Physics, Biology and Protection. 10th ed. Mosby, 2013.

Carlton, Richard, and Arlene Adler. Principles of Radiographic Imaging: An Art and a Science. 5th ed. Cengage, 2013.

VIII. STUDENT MATERIALS FEES

- No Yes

IX. PARALLEL COURSES

College	Course Number	Course Title	Units
CSU Northridge	HSCI 181	Medical Imaging Sciences I	3

Cypress College	RADT 148C	Radiologic Technology	4
Cabrillo College	RT 60	Principles of Radiographic Imaging	2
Foothill College	R T 52A	Principles of Radiology Technology I	4

X. MINIMUM QUALIFICATIONS

Courses in Disciplines in which Masters Degrees are not expected:
 Bachelor's degree and two years experience, or associate degree and six years experience, plus license in the discipline.

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:

Research, using the Library's print and online resources, for papers on such topics as compare a cassette-based and computer-based system. Readings in professional journals accessed through the Library's databases.

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 M10A

A. Sequential course within a discipline.

1. discuss the philosophy and regulations of the Moorpark College Radiography program.
2. describe the practice standards for the radiographer as defined by the The American Society of Radiologic Technologists (ASRT) and the State of California.
3. recall the historic events and individuals that have contributed greatly to the field of radiology.
4. identify the advanced imaging modalities and career opportunities in the field of radiology.
5. describe the structure and function of a typical x-ray department.
6. discuss the importance of documenting and reporting patient history and symptoms.
7. identify methods of and barriers to communication and describe how each may be used or overcome effectively during patient education.
8. describe the ALARA (As Low As Reasonably Achievable) concept.
9. describe standard positioning terms and procedural considerations of radiographic exams.
10. describe the prime factors of mA, kVp, seconds, and distance

that must be considered in radiographic technique.

11. identify the different image receptors used for radiographic imaging.

12. identify key components of an automatic film processor and analyze the steps of the processing cycle by providing the specific action and duration of time for each step.

13. evaluate and critique radiographic images.

- 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 M10AL

- A. Sequential course within a discipline.
 1. assemble the Clinical Portfolio for clinical practicum and review student handbook.
 2. use film-screen cassettes and automatic film processing.
 3. operate radiographic unit and accessories.
 4. select the prime factors of mA (milliamps), kVp (kilovolt peak) seconds, and distance on the x-ray console.
 5. employ the use of radiation shielding devices for both patient and personnel.
 6. describe techniques of radiation protection using parameters of time, distance and shielding.
 7. apply radiation protection methods during fluoroscopic procedures.
 8. apply radiation protection methods during mobile radiographic procedures.

9. practice, through demonstration, the basic body positions used when positioning patients for radiographic examinations.
10. observe, assist and perform radiographic procedures of the chest including adult, pediatric, geriatric, and trauma.
11. observe, assist and perform radiographic procedures of the abdomen including adult, pediatric, geriatric, and trauma.
12. demonstrate the procedures for gowning and gloving for you or another to maintain a sterile field.
13. recall the procedure for emergencies and incidents at the clinical site.
14. demonstrate the appropriate method for lifting, moving, and transporting patients to and from the medical imaging department.
15. demonstrate basic clerical duties in radiology reception such as process the x-ray requisition, use telephone, intercom and paging systems, archive/retrieve images/film, and PACS (picture archiving and communication system).

- 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 M10B

- A. Sequential course within a discipline.
1. describe the electromagnetic spectrum.
 2. describe wavelength and frequency and explain their relationship to velocity.
 3. explain the wave-particle duality phenomena of x-rays.
 4. describe Bohr's theory of atomic structure.

5. explain the processes of ionization and excitation
6. identify the properties of x-rays.
7. describe the different types of x-ray equipment, including diagnostic and fluoroscopic.
8. define potential difference, current, and resistance.
9. compare generators in terms of radiation produced and efficiency.
10. identify the general components of the primary, secondary and filament circuits of an x-ray machine.
11. discuss permanent installation of radiographic equipment in terms of purpose, components, types, and applications.
12. describe functions of components of automatic exposure control devices (AEC).

- 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 M01A

- 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 M01AL

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 M01BL

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 M11

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, meet assignments deadlines, and be prepared to participate in class discussions.
2. Interpersonal: the students will experience the importance of collaboration and of being a team member in the health care field.
3. Information: the students will refer to radiographic technique charts to select the correct amount of radiation 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.
4. Systems: the students will learn to follow specific protocols for the safe use of

radiation production equipment.

5. Technology: the students will differentiate between photostimulable phosphor (PSP) and direct acquisition technology.

The course also addresses the SCANS skills and personal qualities:

1. Basic Skills: the students will read professional journals and manuals related to new radiographic techniques and equipment.
2. Thinking Skills: the students will describe how best to use radiographic equipment for the pediatric, geriatric, and trauma patient.
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; and show respect for each other, others with whom they come in contact, and those in authority.

XV. DISTANCE LEARNING COURSE OUTLINE ADDENDUM

RADT M01B: Not Applicable

XVI. GENERAL EDUCATION COURSE OUTLINE ADDENDUM

RADT M01B: Not Applicable

XVII. STUDENT MATERIALS FEE ADDENDUM

RADT M01B: Not Applicable

XVIII. REPEATABILITY JUSTIFICATION TITLE 5, SECTION 55041

RADT M01B: Not Applicable

XIX. CURRICULUM APPROVAL

Course Information:

Discipline: RADIOLOGIC TECHNOLOGY (RADT)

Discipline Code and Number: RADT M01B

Course Revision Category: Substantial Course Revision

Course Proposed By:

Originating Faculty: Robert Darwin 04/12/2016

Faculty Peer: Guadalupe Aldana 05/11/2016

Curriculum Rep: Linda Loiselle 04/13/2016

Department Chair: Carol Higashida 08/24/2016

Division Dean: Norman Marten 05/07/2016

Approved By:

Curriculum Chair: Jerry Mansfield 09/09/2016

Executive Vice President: Julius Sokenu 09/18/2016

Articulation Officer: Letrisha Mai 05/05/2016

Librarian: Mary LaBarge 05/03/2016

Implementation Term and Year: Fall 2017

Approval Dates:

Approved by Moorpark College Curriculum Committee: 09/06/2016

Approved by Board of Trustees (if applicable): 12/13/2016

Approved by State (if applicable): 01/19/2017