

RADT M10B: INTRODUCTION TO RADIOGRAPHIC TECHNIQUE

Originator

rdarwin

College

Moorpark College

Discipline (CB01A)

RADT - Radiologic Technology

Course Number (CB01B)

M10B

Course Title (CB02)

Introduction to Radiographic Technique

Banner/Short Title

Intro Radiographic Technique

Credit Type

Credit

Start Term

Summer 2020

Catalog Course Description

Provides a basic knowledge of radiographic equipment design and operations. Covers introduction to radiation production, radiation protection and different types of digital radiographic equipment.

Taxonomy of Programs (TOP) Code (CB03)

1225.00 - *Radiologic Technology

Course Credit Status (CB04)

D (Credit - Degree Applicable)

Course Transfer Status (CB05) (select one only)

B (Transferable to CSU only)

Course Basic Skills Status (CB08)

N - The Course is Not a Basic Skills Course

SAM Priority Code (CB09)

C - Clearly Occupational

Course Cooperative Work Experience Education Status (CB10)

N - Is Not Part of a Cooperative Work Experience Education Program

Course Classification Status (CB11)

Y - Credit Course

Educational Assistance Class Instruction (Approved Special Class) (CB13)

N - The Course is Not an Approved Special Class

Course Prior to Transfer Level (CB21)

Y - Not Applicable

Course Noncredit Category (CB22)

Y - Credit Course

Funding Agency Category (CB23)

Y - Not Applicable (Funding Not Used)

Course Program Status (CB24)

1 - Program Applicable

General Education Status (CB25)

Y - Not Applicable

Support Course Status (CB26)

N - Course is not a support course

Field trips

Will not be required

Grading method

(L) Letter Graded

Does this course require an instructional materials fee?

No

Repeatable for Credit

No

Is this course part of a family?

No

Units and Hours

Carnegie Unit Override

No

In-Class

Lecture

Minimum Contact/In-Class Lecture Hours

35

Maximum Contact/In-Class Lecture Hours

35

Activity

Laboratory

Minimum Contact/In-Class Laboratory Hours

0

Maximum Contact/In-Class Laboratory Hours

0

Total in-Class

Total in-Class

Total Minimum Contact/In-Class Hours

35

Total Maximum Contact/In-Class Hours

35

Outside-of-Class

Internship/Cooperative Work Experience

Paid

Unpaid

Total Outside-of-Class

Total Outside-of-Class

Minimum Outside-of-Class Hours

70

Maximum Outside-of-Class Hours

70

Total Student Learning

Total Student Learning

Total Minimum Student Learning Hours

105

Total Maximum Student Learning Hours

105

Minimum Units (CB07)

2

Maximum Units (CB06)

2

Prerequisites

Admission to Moorpark College Radiologic Technology Program

Corequisites

RADT M10A and RADT M10AL

Limitations on Enrollment

Criminal background clearance

Drug and alcohol clearance

Proof of freedom from and immunity to communicable diseases

No acrylic or long nails in clinical settings

Current negative TB test or chest x-ray

Others (specify)

Physical examination demonstrating general good health

No visible tattoos or visible body piercings except single studs in earlobes

Other Limitations on Enrollment

Fire Safety Card

Proof of health insurance

Proof of professional liability insurance

Entrance Skills

Entrance Skills

RADT M10A

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.

Entrance Skills

RADT M10AL

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 (milliamperes), 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).

Requisite Justification

Requisite Type

Prerequisite

Requisite

Admission to the Moorpark College Radiologic Technology Program

Requisite Description

Credit program requisite (credit only)

Level of Scrutiny/Justification

Required by statute or regulation

Requisite Type

Corequisite

Requisite

RADT M10A

Requisite Description

Course in a sequence

Level of Scrutiny/Justification

Required by statute or regulation

Requisite Type

Corequisite

Requisite

RADT M10AL

Requisite Description

Course in a sequence

Level of Scrutiny/Justification

Required by statute or regulation

Requisite Type

Enrollment Limitation

Requisite

1) Criminal background clearance; 2) Current CPR certification for health care provider (American Heart Association); 3) Drug and alcohol clearance; 4) No acrylic or long nails in clinical settings; 5) Current negative TB test or chest x-ray; 6) Physical examination demonstrating general good health; 7) No visible tattoos or visible body piercings except single studs in earlobes; 8) Other, Fire Safety Card, proof of health insurance, and proof of professional liability insurance.

Requisite Description

Credit program requisite (credit only)

Level of Scrutiny/Justification

Required by statute or regulation

Student Learning Outcomes (CSLOs)

Upon satisfactory completion of the course, students will be able to:

- 1 discuss x-rays as an electromagnetic wave and its properties.
- 2 describe the major components of an x-ray system, including the circuitry and x-ray tube.

Course Objectives

Upon satisfactory completion of the course, students will be able to:

- 1 describe Bohr's theory of atomic structure.
- 2 explain the processes of ionization and excitation
- 3 describe the electromagnetic spectrum.
- 4 describe wavelength and frequency and explain their relationship to velocity.
- 5 explain the wave-particle duality phenomena of x-rays.
- 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).

Course Content

Lecture/Course Content

- 4% Structure of the atom
- 14% Electromagnetic radiation
- 4% Electricity
- 4% Transformers
- 6% Rectification
- 6% Generators
- 20% X-ray circuits

- 12% Radiographic equipment
- 10% Permanent installations
- 10% Mobile equipment
- 10% Properties of x-rays

Laboratory or Activity Content

None

Methods of Evaluation

Which of these methods will students use to demonstrate proficiency in the subject matter of this course? (Check all that apply):

- Problem solving exercises
- Written expression

Methods of Evaluation may include, but are not limited to, the following typical classroom assessment techniques/required assignments (check as many as are deemed appropriate):

- Classroom Discussion
- Essay exams
- Objective exams
- Problem-solving exams
- Participation
- Quizzes
- Reports/papers

Instructional Methodology

Specify the methods of instruction that may be employed in this course

- Audio-visual presentations
- Collaborative group work
- Class discussions
- Demonstrations
- Lecture
- Small group activities

Describe specific examples of the methods the instructor will use:

- PowerPoint presentations and group breakout sessions discussing the presentations.
- Group breakout session for math problems.

Representative Course Assignments

Writing Assignments

- Write answers to each lesson objectives.
- Write answers to discussion questions in the textbook pertaining to radiographic equipment design and operations.
- Draw and label the circuits and tube in an x-ray system.

Critical Thinking Assignments

- Draw and trace the flow of current in an x-ray circuit chart.
- Calculate generator output based on incoming voltage.
- Identify type of transformer and describe its use in an x-ray circuit chart.

Reading Assignments

- Reading American Society of Radiologic Technologist (ASRT) journal articles.
- Read California Department of Health- Radiation Health Branch Title 17 regulations.

Outside Assignments

Representative Outside Assignments

- Develop a schematic of an x-ray generator and tube circuitry.
- Perform library and Internet research on specific subject matter.

Articulation

Equivalent Courses at other CCCs

| College | Course ID | Course Title | Units |
|-------------------------|-------------|---------------------------------------|-------|
| Cypress College | RADT 142C | Radiological Electronics | 4 |
| Long Beach City College | DMI 11 | Radiographic Techniques | 1 |
| L.A. City College | RAD TEC 200 | Introduction to Radiologic Technology | 3 |

District General Education

A. Natural Sciences

B. Social and Behavioral Sciences

C. Humanities

D. Language and Rationality

E. Health and Physical Education/Kinesiology

F. Ethnic Studies/Gender Studies

Course is CSU transferable

Yes

CSU Baccalaureate List effective term:

Fall 2005

CSU GE-Breadth

Area A: English Language Communication and Critical Thinking

Area B: Scientific Inquiry and Quantitative Reasoning

Area C: Arts and Humanities

Area D: Social Sciences

Area E: Lifelong Learning and Self-Development

Area F: Ethnic Studies

CSU Graduation Requirement in U.S. History, Constitution and American Ideals:

IGETC

Area 1: English Communication

Area 2A: Mathematical Concepts & Quantitative Reasoning

Area 3: Arts and Humanities

Area 4: Social and Behavioral Sciences

Area 5: Physical and Biological Sciences

Area 6: Languages Other than English (LOTE)

Textbooks and Lab Manuals

Resource Type

Textbook

Classic Textbook

No

Description

Bushong, Stewart. *Radiographic Science for Technologists: Physics, Biology and Protection*. 11th ed., Mosby, 2017.

Description

Carroll, Quinn. *Radiography in the Digital Age: Physics - Exposure - Radiation Biology*. 3rd ed., Charles C. Thomas, 2018.

Library Resources

Assignments requiring library resources

Locate and read professional health care and medical journal articles by using the Library's print and online resources.

Sufficient Library Resources exist

Yes

Example of Assignments Requiring Library Resources

Research professional journals for radiographic x-ray equipment and the latest advancements in technology.

Primary Minimum Qualification

RADIOLOGIC TECHNOLOGY

Review and Approval Dates

Department Chair

01/28/2020

Dean

01/30/2020

Technical Review

02/20/2020

Curriculum Committee

03/03/2020

DTRW-I

03/12/2020

Curriculum Committee

MM/DD/YYYY

Board

04/14/2020

CCCCO

04/30/2020

Control Number

CCC000616715

DOE/accreditation approval date

MM/DD/YYYY