

# RADT M03: ADVANCED RADIOGRAPHIC TECHNIQUE

**Originator**

atorabyan

**Co-Contributor(s)**
**Name(s)**

Darwin, Robert (rdarwin)

**College**

Moorpark College

**Discipline (CB01A)**

RADT - Radiologic Technology

**Course Number (CB01B)**

M03

**Course Title (CB02)**

Advanced Radiographic Technique

**Banner/Short Title**

Advanced Radiographic Techniqu

**Credit Type**

Credit

**Start Term**

Spring 2021

**Catalog Course Description**

Introduces the advanced radiography student to the theory of computed tomography including physics, instrumentation, patient care and imaging procedures. Covers cross sectional anatomy using computed tomography and magnetic resonance images.

**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)**

B - Advanced 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

**Alternate grading methods**

(O) Student Option- Letter/Pass

(P) Pass/No Pass Grading

**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**

70

**Maximum Contact/In-Class Lecture Hours**

70

**Activity**

**Minimum Contact/In-Class Activity Hours**

0

**Maximum Contact/In-Class Activity Hours**

0

**Laboratory****Total in-Class****Total in-Class****Total Minimum Contact/In-Class Hours**

70

**Total Maximum Contact/In-Class Hours**

70

**Outside-of-Class****Internship/Cooperative Work Experience****Paid****Unpaid****Total Outside-of-Class****Total Outside-of-Class****Minimum Outside-of-Class Hours**

140

**Maximum Outside-of-Class Hours**

140

**Total Student Learning****Total Student Learning****Total Minimum Student Learning Hours**

210

**Total Maximum Student Learning Hours**

210

**Minimum Units (CB07)**

4

**Maximum Units (CB06)**

4

**Prerequisites**

RADT M02A and RADT M02B

**Corequisites**

RADT M03B and RADT M03L

**Limitations on Enrollment**

Criminal background clearance

Current CPR certification for health care provider (American Heart Association) or professional rescuer (American Red Cross)

Drug and alcohol clearance

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; CPR BLS from American Heart Association; Admission to the Moorpark College Radiologic Technology

## Entrance Skills

### Entrance Skills

RADT M02A and RADT M02B

### Prerequisite Course Objectives

RADT M02A-explain the routine and special positions/projections for all radiographic/fluoroscopic procedures.

RADT M02A-discuss equipment and supplies necessary to complete skull radiographic and fluoroscopic procedures.

RADT M02A-identify the structures demonstrated on routine radiographic and fluoroscopic images.

RADT M02A-critique radiographic and fluoroscopic images for diagnostic quality including part position, anatomy visualized, contrast, density, markers and collimation.

RADT M02A-discuss general radiation safety and protection practices associated with radiographic and fluoroscopic examinations.

RADT M02A-name the type, dosage and route of administration of contrast media commonly used to perform radiographic contrast and special studies.

RADT M02A-discuss the importance of documenting and reporting patient history, symptoms, and unsafe incidences.

RADT M02A-compare special considerations for trauma, surgical, mobile, geriatric, and pediatric patients with the normal adult.

RADT M02A-explain angiographic and interventional procedures performed in a radiology department.

RADT M02A-describe computed tomography, magnetic resonance imaging (MRI), ultrasound, radiation therapy, nuclear medicine and their role in diagnostic imaging.

RADT M02B-evaluate the basic legal and ethical principles/methods for radiation protection.

RADT M02B-identify personnel monitoring devices in terms of type, purpose, characteristics, advantages and disadvantages.

RADT M02B-evaluate the relationship of exposure factors to patient dosage.

RADT M02B-identify dose equivalent limits for radiation workers and the general public.

RADT M02B-identify the various responses of human tissue and organs as a result of radiation exposure.

RADT M02B-identify federal and state regulatory agencies and their functions.

RADT M02B-discuss regulations (state and federal) influencing radiation protection.

RADT M02B-validate the purpose of Title 17 (the California Radiation Health and Safety Act) and the National Council on Radiation Protection and Measurements (NCRP).

RADT M02B-differentiate between procedural factor problems and equipment malfunctions.

RADT M02B-evaluate the results of basic quality control tests and discuss the benefits of a quality management program to the patient and the department.

RADT M02B-discuss Picture Archiving and Communication Systems (PACS), Digital Imaging and Communication in Medicine (DICOM), Hospital Information System (HIS) and their integration in an imaging department.

RADT M02B-describe the various types of digital receptors, their function, limits and advantages.

RADT M02B-relate the histogram analysis to automatic rescaling and how it affects the exposure indicator.

RADT M02B-relate the exposure indicator value to technical factors, system calibration, part/beam/plate alignment, and patient exposure.

## Requisite Justification

### Requisite Type

Prerequisite

### Requisite

RADT M02A and RADT M02B

### Requisite Description

Course in a sequence

### Level of Scrutiny/Justification

Required by statute or regulation

### Requisite Type

Corequisite

### Requisite

RADT M03B and RADT M03L

### Requisite Description

Course in a sequence

### Level of Scrutiny/Justification

Required by statute or regulation

**Requisite Type**

Enrollment Limitation

**Requisite**

Checked boxes

**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 | name and describe the purpose and function of common components of computed tomography (CT).                              |
| 2 | explain the process of data acquisition, reconstruction and reformatting of computed tomography images.                   |
| 3 | identify and recognize anatomy and common pathology on computed tomography and Magnetic resonance cross-sectional images. |

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

- |    |  |
|----|--|
| 1  | describe the components of the CT (computed tomography) imaging system                               |
| 2  | list the computer data processing steps  |
| 3  | name the common controls found on a CT operator console and describe the how and why each is used    |
| 4  | describe the principles of CT data acquisition   |
| 5  | list and describe the steps in CT image reconstruction and display                                   |
| 6  | explain CT image post-processing and data management   |
| 7  | discuss image quality in reference to CT acquired images   |
| 8  | discuss general anatomical structures on CT and MR (magnetic resonance) images                       |
| 9  | describe the relationship of each anatomical structure to surrounding structures on CT and MR images |
| 10 | describe the function of each anatomical structure found on CT and MR images                         |

**Course Content****Lecture/Course Content**

- 20% Computed Tomography history and physical principles
- 20% Computed tomography data acquisition, image processing, reconstruction and display.
- 20% Computed tomography procedures
- 10% Head and neuroanatomy
- 10% Neck, thorax sectional anatomy and scanning parameters
- 10% Abdomen and pelvis sectional anatomy and scanning parameters
- 10% Extremity sectional anatomy and scanning parameters

**Laboratory or Activity Content**

n/a

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

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  
 Clinical demonstration  
 Essay exams  
 Objective exams  
 Problem-solving exams  
 Quizzes

## **Instructional Methodology**

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

Audio-visual presentations  
 Class activities  
 Distance Education  
 Instructor-guided interpretation and analysis  
 Lecture  
 Small group activities

**Describe specific examples of the methods the instructor will use:**

Instructor will use power-point presentation and subject related YouTube videos to illustrate course content.

## **Representative Course Assignments**

### **Writing Assignments**

1. In-class group work for analyzing and identifying anatomy in CT workbook.
2. Individual assignment labeling anatomy in cross sectional workbook.

### **Critical Thinking Assignments**

1. Analysis and identification of anatomy on cross sectional CT images.
2. Calculations on Window setting
3. In-class group work and individual writing assignments on principles of CT physics and image data acquisition and reconstruction.

### **Reading Assignments**

1. ASRT (American Society of Radiologic Technology ) peer reviewed articles with quiz on radiation safety, image quality, new imaging methods, and pathology.
2. American Society of Radiologic Technology (ASRT) peer reviewed article, "Patient Dose From CT: A Literature Review."

## **Outside Assignments**

### **Representative Outside Assignments**

research for a presentation on a CT exam.  
 assigned readings on radiographic journals.

## **Articulation**

### **Equivalent Courses at 4 year institutions**

<b>University</b>	<b>Course ID</b>	<b>Course Title</b>	<b>Units</b>
Foothill College	RT 63	Advanced Radiographic Principles	3
Cypress College	RADT 162C	Radiology Special Procedures	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 1995

**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

**Description**Romans, Lois. *Computed Tomography for Technologists: A Comprehensive Text*. 2nd Ed., Wolters Kluwer, 2019.**Resource Type**

Textbook

### Description

Lazo, Denise L. *Fundamentals of Sectional Anatomy: An Imaging Approach*. 2nd ed., Cengage, 2014.

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## Library Resources

### Assignments requiring library resources

Radiographic and medical journal reading assignments which may use the Library's print and online resources.

### Sufficient Library Resources exist

Yes

### Example of Assignments Requiring Library Resources

Locate and analyze peer-reviewed articles on related topics including: radiation safety, image quality, new imaging methods, and pathology.

## Distance Education Addendum

### Definitions

#### Distance Education Modalities

Hybrid (51%–99% online)

Hybrid (1%–50% online)

100% online

### Faculty Certifications

Faculty assigned to teach Hybrid or Fully Online sections of this course will receive training in how to satisfy the Federal and state regulations governing regular effective/substantive contact for distance education. The training will include common elements in the district-supported learning management system (LMS), online teaching methods, regular effective/substantive contact, and best practices.

Yes

Faculty assigned to teach Hybrid or Fully Online sections of this course will meet with the EAC Alternate Media Specialist to ensure that the course content meets the required Federal and state accessibility standards for access by students with disabilities. Common areas for discussion include accessibility of PDF files, images, captioning of videos, Power Point presentations, math and scientific notation, and ensuring the use of style mark-up in Word documents.

Yes



## Regular Effective/Substantive Contact

### Hybrid (1%–50% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	<p>The online instructor will provide lesson plans that require activities such as reading course material from a mandatory textbook. Additionally, the instructor 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. Learning objectives; students may complete homework through the workbook system provided by a publishing company and use a "discussion" tool to post questions and interact with the instructor and classmates.</p> <p>Students may test their knowledge with interactive online quizzes provided by the publishing company.</p> <p>Students may engage in internet searches and library online database resources on topics corresponding to course content</p> <p>Students may submit questions to the instructor by email or ask in person in a virtual classroom; the instructor may create student groups or group activities using the online course.</p> <p>Quizzes may be issued (using a course-specific timeline) in which students will be tested on their knowledge of the material. Assignments may include exercises through which students explore course concepts using a textbook and/or additional research. Students can submit their assignments online and get feedback from the instructor and/or students as determined per assignment. This can be an interactive process in that students can receive feedback and then be able to improve their submittal if necessary.</p>
E-mail	<p>Contact students via e-mail within the course shell, by campus e-mail, and/or MyVCCCD.</p>
Other DE (e.g., recorded lectures)	<p>The online instructor 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. The "Announcement" tool will be used to remind students of important assignments and due dates. To provide students with an online schedule of class events the "calendar" tool will be used to schedule virtual classroom sessions in the online course shell.</p>
Synchronous Dialog (e.g., online chat)	<p>Meet with students for study sessions and online office hours using an online communication tool. Additionally, the instructor may engage students using the following communication activities available in the online classroom.</p> <p>Students may view publisher based PowerPoint slides and/or text-based lessons corresponding to course content and learning objectives. Students may complete homework through the online course, and/or using the workbook provided by the publishing company; students may test their knowledge with interactive online quizzes provided by the publishing company. Students may engage in internet searches and library online database resources on topics corresponding to course content and learning objectives.</p> <p>Quizzes/tests may be issued (using a course-specific timeline) in which students will be tested on their knowledge of the material. Assignments may include exercises through which students explore course concepts using a textbook and/or additional research. Students can submit their assignments online and get feedback from the instructor. Students may submit questions to the instructor by email or ask in person. The instructor may create student groups or group activities using the online course.</p>

Video Conferencing	<p>It will include lectures and study sessions. The instructor may involve students in active learning with the following activities:</p> <p>Students may view instructor shared power points slides, video lessons and/or text-based lessons corresponding to course content and learning objectives. Students may complete homework through the online course. Students may use the workbook provided by the publishing company. Students may engage in internet searches and library online database resources on topics corresponding to course content. Students may test their knowledge with interactive online quizzes provided by the publishing company. Students may submit questions to the instructor via email or ask in person in a virtual classroom; the instructor may create student groups or group activities using the online course. Quizzes/tests may be issued (using a course-specific timeline) in which students will be tested on their knowledge of the material. Assignments may include exercises through which students explore course concepts using a textbook and/or additional research. Students can submit their assignments online and get feedback from the instructor. Students may submit questions to the instructor by email or ask in person and/or use "chat" to post a question(s). The instructor may create student groups or group activities using the online course.</p>
<b>Hybrid (51%–99% online) Modality:</b>	
<b>Method of Instruction</b>	<b>Document typical activities or assignments for each method of instruction</b>
Asynchronous Dialog (e.g., discussion board)	<p>The online instructor will provide lesson plans that require activities such as reading course material from a mandatory textbook. Additionally, the instructor 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. Learning objectives; students may complete homework through the workbook system provided by a publishing company and use a "discussion" tool to post questions and interact with the instructor and classmates.</p> <p>Students may test their knowledge with interactive online quizzes provided by the publishing company. Students may engage in internet searches and library online database resources on topics corresponding to course content. Students may submit questions to the instructor by email or ask in person in a virtual classroom; the instructor may create student groups or group activities using the online course. Quizzes may be issued (using a course-specific timeline) in which students will be tested on their knowledge of the material. Assignments may include exercises through which students explore course concepts using a textbook and/or additional research. Students can submit their assignments online and get feedback from the instructor and/or students as determined per assignment. This can be an interactive process in that students can receive feedback and then be able to improve their submittal if necessary.</p>
E-mail	Contact students via e-mail within the course shell, by campus e-mail, and/or MyVCCCD.
Other DE (e.g., recorded lectures)	<p>The online instructor 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. The "Announcement" tool will be used to remind students of important assignments and due dates. To provide students with an online schedule of class events the "calendar" tool will be used to schedule virtual classroom sessions in the online course shell.</p>

**Synchronous Dialog (e.g., online chat)**

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Students may view publisher based PowerPoint slides and/or text-based lessons corresponding to course content and learning objectives. Students may complete homework through the online course, and/or using the workbook provided by the publishing company; students may test their knowledge with interactive online quizzes provided by the publishing company. Students may engage in internet searches and library online database resources on topics corresponding to course content and learning objectives.

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**100% online Modality:**

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E-mail	Contact students via e-mail within the course shell, by campus e-mail, and/or MyVCCCD.
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**Examinations****Hybrid (1%–50% online) Modality**

Online  
On campus

**Hybrid (51%–99% online) Modality**

Online  
On campus

**Primary Minimum Qualification**

RADIOLOGIC TECHNOLOGY

**Review and Approval Dates****Department Chair**

10/12/2020

**Dean**

10/14/2020

**Technical Review**

10/15/2020

**Curriculum Committee**

10/20/2020

**DTRW-I**

MM/DD/YYYY

**Curriculum Committee**

MM/DD/YYYY

**Board**

MM/DD/YYYY

**CCCCO**

11/18/2020

**Control Number**

CCC000432775

**DOE/accreditation approval date**  
MM/DD/YYYY