



MASTER COURSE OUTLINE

A. RADT 2307 Computed Tomography

B. COURSE DESCRIPTION:

This course introduces the student to the basic fundamentals of computed tomography (CT), physics, patient safety and procedures including sectional anatomy. The history of CT and image production will be included in the course. Students explore the function of the hardware components of the computed tomography computer system, equipment, instrumentation, data acquisition, image processing and reconstruction. The course covers the importance of legal and ethical responsibilities as an imaging professional. Patient care, assessment, communication and contrast administration are discussed. CT procedures including sectional anatomy of the head, neck, thorax and abdomen/pelvis, musculoskeletal, and vascular system are presented. Consideration is given to the production of digital images of optimal diagnostic quality with emphasis of radiation safety. Prerequisites: RADT 2215, 2283 or registered Radiologic Technologist. This course is part of the Radiography program, which is accredited by the Joint Review Committee on Education in Radiologic Technology (JRCERT).

(2 Cr – 2 lect, 0 lab)

C. **Core Theme: Critical Thinking

D. RIVERLAND INSTITUTIONAL LEARNING OUTCOMES:

This course addresses the following Riverland Institutional Learning Outcome(s):

- ILO 1: critical thinking (*Core Theme Goal 2*)
- ILO 2: awareness of the larger global community (*Core Theme Goal 7 or Goal 8*)
- ILO 3: ethical, engaged citizenship (*Core Theme Goal 9 or Goal 10*)
- ILO 4: communication and collaboration (*Discipline Goal 1 and by any learning outcome(s) involving communication or collaboration*)

E. MAJOR CONTENT AREAS:

- History of computed tomography
- CT equipment
- Digital image processes
- Components of CT computer system including Operator console parameters
- Data acquisition
- CT image reconstruction
- Image quality factors and critique

- Post-processing techniques including recording and archiving CT data
- Workstation applications
- Computed tomography (CT)
- Anatomical body planes
- Cerebral, Thorax, Abdominal, Pelvis, Vascular and skeletal anatomy
- Pathological Processes
- Radiation Dose and Radiation safety
- Patient care and communication
- Contrast administration
- ARRT Code of Ethics including legal and ethical responsibilities
- Computed Tomography (CT) protocols
- Special considerations with pediatric and trauma patients
- Radiation protection
- Quality Control

F. GOAL TYPE, OBJECTIVES, AND OUTCOMES:

<u>GOAL TYPE</u>	<u>OBJECTIVES</u> Students will be able to	<u>OUTCOMES</u> The student will successfully
**Critical Thinking	gather factual information and apply it to a given problem in a manner that is relevant, clear, comprehensive, and conscious of possible bias in the information selected.	<ol style="list-style-type: none"> 1. describe techniques in manipulating CT parameters to optimize image quality. 2. determine the appropriate contrast agent and route of administration for the requested CT exam.
<u>CS</u>	understand the basic concepts to computed tomography and CT image production and reconstruction.	<ol style="list-style-type: none"> 1. describe the basic principles and concepts of computed tomography, image production and reconstruction.
<u>CS</u>	describe the methods of recording and archiving CT data.	<ol style="list-style-type: none"> 1. identify the methods of recording and archiving CT data.
	recognize the operating systems and parameters.	<ol style="list-style-type: none"> 1. explain how adjusting operator console parameters affects CT image data.
<u>CS</u>	recognize anatomy of the cerebrum, thorax, abdomen, pelvis and vascular systems.	<ol style="list-style-type: none"> 1. locate and identify pertinent anatomy. 2. distinguish between arterial and venous anatomy.
<u>CS</u>	recognize normal anatomy from those involved in pathology.	<ol style="list-style-type: none"> 1. compare and contrast between normal anatomy and a pathologic condition. 2. identify cross-sectional anatomy in sagittal, coronal, and axial planes on CT.
<u>CS</u>	understand the importance of radiation protection.	<ol style="list-style-type: none"> 1. describe how to reduce radiation exposure to the patient and technologist.
<u>CS</u>	recognize the most common CT exams including the role of CT in trauma imaging.	<ol style="list-style-type: none"> 1. articulate the proper positioning and selection of the scan parameters for a common CT exam. 2. explain modification for trauma imaging.
<u>CS</u>	understand appropriate communication skills for patients and family members.	<ol style="list-style-type: none"> 1. demonstrate appropriate communication skills for specific age groups.

<u>CS</u>	recognize the importance of CT image quality and quality control tests.	<ol style="list-style-type: none"> 1. identify the factors that influence image quality. 2. list the quality control tests for CT.
-----------	---	--

G. SPECIAL INFORMATION:

This course may require use of the Internet, the submission of electronically prepared documents and the use of a course management software program. Students who have a disability and need accommodations should contact the instructor or the Student Success Center at the beginning of the semester. This information will be made available in alternative format, such as Braille, large print, or current media, upon request.

H. COURSE CODING INFORMATION: Course Code X /Class Maximum 20; Letter Grade

Revision date: 10/24/19; 03/30/22

AASC Approval date: 12/17/19; 05/03/22

*Riverland Community College Disciplines	MnTC Goal Number
Communication (CM)	1
Natural Sciences (NS)	3
Mathematics/Logical Reasoning (MA)	4
History and the Social & Behavioral Sciences (SS)	5
Humanities and Fine Arts (HU)	6

**Riverland Community College Core Themes	MnTC Goal Number
Critical Thinking (CT)	2
Human Diversity (HD)	7
Global Perspective (GP)	8
Ethical and Civic Responsibility (EC)	9
People and the Environment (PE)	10

*These five MnTC Goals have been identified as Riverland Community College Disciplines.

** These five MnTC Goals have been identified as Riverland Community College Core Themes.

NOTE: The Minnesota Transfer Curriculum "10 Goal Areas of Emphasis" are reflected in the five required discipline areas and five core themes noted in the Riverland Community College program of study guide and/or college catalog.