Course Information Form (CIF)

Course Code: XCT 210

Course Title: Computed Tomography Imaging

Department: Allied Health
PCS Code: 1.2 - Occupational/Technical Instruction
CIP Code: 51.0907
Repeatability: 0

Effective Date: Summer 2026

Credit Hours

Catalog Notation: 3-0-3
Credit Hour Distribution:

Lecture: 3	Lab: 0	Clinical: 0	**Total: 3**

General Course Information

Catalog Description

History, physics, and system operational components of computed tomography imaging. Image acquisition, display, reconstruction, and quality control.

General Course Objectives

This course will focus on the general physical principles, operating systems, and history of computed tomography (CT). This course will also examine CT data acquisition, reconstruction, processing, and image artifacts.

Minimum Placement Levels

English	Reading	Math
Placement out of ENG 099	Placement out of CCS 099	Placement out of MAT 072

Prerequisites

Concurrent enrollment in XRA 213, XRA 214, and XRA 232
Admission into the Radiologic Technology program

Recommended before enrolling (not required):
ARRT primary certification

Methods of Evaluation

6-8 objective quizzes, 1 objective exam, 1 case study project, and written report.

Instructional Materials and Additional Supplies

Computed Tomography: Physical Principles, Clinical Applications and Quality Control, current edition, Euclid Seeram. 978-0323312882

Course Content

General Learning Outcomes (GLOs)

- Communication: Students will demonstrate the ability to read, write, listen, and speak effectively.
- Reasoning and Inquiry: Students will demonstrate the ability to solve problems using deductive reasoning and logic, quantitative reasoning, or the scientific method.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
CT System Principles, Operation, and Components	1. Identify the basic components of CT tubes. 2. List advantages and disadvantages of various types of CT tubes. 3. Relate the CT system components to their function. 4. Describe technique selection in CT. 5. Describe the various generations of CT imaging systems. 6. Discuss equipment maintenance procedures.	12	0	0
Image Processing and Display: Image Reconstruction	1. Discuss image reconstruction, interpolation, and back projection. 2. Explain the function of algorithms. 3. Differentiate between raw data and image data. 4. Discuss the process of prospective and retrospective reconstruction. 5. Define effective slice thickness. 6. Describe reconstruction interval.	6	0	0
Image Display	1. List advantages and limitations of multislice spiral CT. 2. Describe CT imaging characteristics for image matrix and Hounsfield unit. 3. Differentiate between a pixel and voxel. 4. Describe the function of window level, width, and plane specification. 5. Compare and contrast various CT numbers with respect to anatomy.	6	0	0
Post-processing	1. Explain CT imaging relationships among pitch and index. 2. Describe the process of 3-D rendering. 3. Identify various quantitative measurements. 4. Differentiate between quantitative measurements in volume, distance, and diameter.	6	0	0
Data Management	1. Describe the function of CT image storage and archiving. 2. Discuss the process for electronic transmission.	3	0	0
Image Quality	1. Discuss image quality as it relates to spatial resolution, contrast resolution, noise, linearity, and uniformity. 2. Discuss the procedures for assessing quality assurance. 3. Explain how quality assurance affects both quality imaging and patient care.	6	0	0
Artifact Recognition/Reduction	1. Describe beam hardening and the control parameters. 2. Discuss various techniques for controlling motion. 3. Define edge gradient. 4. Identify ring artifacts, streaks, tube arching, and cone beam. 5. Discuss methods for reducing equipment artifacts.	6	0	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
45	0	0