



Course Syllabus
SEMESTER
School of Nursing and Health Professions

<i>Course Name:</i>	Fundamental Principles of Computed Tomography
<i>Course & Section Number:</i>	MIT 251-XXX
<i>Meeting Day(s) & Time(s):</i>	Online
<i>Credits:</i>	4
<i>Contact Hours:</i>	
<i>Text:</i>	
<i>Instructor's Name:</i>	
<i>Office Hours & Location:</i>	
<i>Phone:</i>	
<i>OCC Email:</i>	
<i>Additional Contact Information:</i>	

Catalog description:

A physics course for the medical imager preparing for the A.R.R.T. advanced level CT certification examination. Discusses the fundamentals of the physical principles related to Computed Tomography. Computed tomography instrumentation, scanner geometries and data acquisition are presented. Digital image reconstruction, post processing and manipulation are discussed. Includes emphasis on quality control processes, image artifacts and radiation dose.

Prerequisite/Corequisites:

Certification in Medical Imaging or permission of the department chair. No corequisites.

Course Materials:

Lois E. Romans BA,RT(R)(CT)

Computed Tomography for Technologists: A Comprehensive Text, 2nd Ed.

Lippincott Williams & Wilkins, 2018

What You Will Learn in the Course

Course Objectives:

Completion of this course will assist the student in passing the advanced level certification exam (ARRT) in Computed Tomography.

Student Learning Outcomes:

Students will:

1. Understand the physical principles of CT physics.
2. List and describe the instrumentation of CT scanners including a knowledge of x-ray production and CT detector basics.
3. List and describe the methods of CT data acquisition including scanning geometries and modes of scanning.
4. Understand the technical parameters of CT image acquisition and how they impact scan time, image quality, and radiation dose.
5. Understand the principles of CT image reconstruction and post-processing capabilities.
6. Discuss basics of digital images, CT image display, image manipulation, and data management.
7. Recognize aspects of CT image quality and identify image artifacts.
8. Understand aspects of radiation safety relevant to CT and issues surrounding radiation dose.

Institutional General Education Competencies:

As a student at Owens Community College, you will take General Education courses as part of your degree program. While specific to the General Education courses, will be reinforced in many of your degree program major courses and may be measured in your capstone course(s) and others as identified.

Academic Support

Disability Services Resource Center: If you have a disability or acquire one, you may be entitled to receive reasonable accommodations intended to assure you an equal opportunity to participate in and benefit from the program. To receive more information or to register for accommodations, please contact the Disability Resource Center at 567-661-7007, email disability@owens.edu, visit <https://www.owens.edu/disability/>, or stop by College Hall 124.

Tutoring Services: Owens Community College offers academic tutoring and assistance in a variety of subjects including: accounting, computing, economics, mathematics, science, and writing. For more information go to: <https://www.owens.edu/successcenters/>.

Counseling Services: Counseling Services provides assistance to students experiencing personal, educational, interpersonal/relationship, family, social, or psychological difficulties. If you feel you may benefit from this service, please contact them at counselingservices@owens.edu. More information is at <https://www.owens.edu/counseling/>.

Campus and Community Connections: The Center for Campus and Community Connections (College Hall 123) is a walk-in office created to provide retention support through resource stability initiatives and community connections. Go here for more information: <https://www.owens.edu/connection/> or contact connections@owens.edu

Owens Library: The Owens Library offers two locations (Toledo and Findlay) as well as online resources. For more information visit <https://www.owens.edu/library/>.

Students can find more information on campus resources, student support, student life, and security at this [link](#).

General Information

Student Code of Conduct: All students are expected to follow Owens Community College's Student Code of Conduct, which includes academic honesty, encompassing plagiarism. See the Board Policy for more information.

Anti-Discrimination and Harassment & Title IX/Sexual Misconduct: All students, faculty, and staff are expected to follow Owens Community College's Anti-Discrimination and Harassment Policy and the College's Title IX Policy/Sexual Misconduct Procedures and Guidelines. The College strictly prohibits and will not tolerate harassment, discrimination, intimidation, or hostile/offensive working or learning environments.

Religious Accommodations: A student seeking an accommodation for an absence permitted under Ohio's Testing Your Faith Act must provide the instructor with a written email notice with the specific dates for an absence, and must do so not later than fourteen (14) days after the first day of instruction. Alternative accommodations are not retroactive, and no academic penalty will be imposed for an absence under the policy*. The request for an alternative accommodation will be kept confidential. Students with questions about a religious accommodation under Ohio's Testing your Faith Act may contact the College's Office of Academic Affairs: provost@owens.edu. The policy may be found on the Owens website: [3358:11-2-63 Accommodation for a Student Absence for the Observance of Religious Beliefs and Practices Policy](#)

Document Collection: Throughout the semester, your instructors may ask for a variety of assignments including tests and/or quizzes for student learning of institutional general education competencies or program assessment. Please save all your class materials until the end of the semester.

Classroom Admittance: OCC classes shall only be attended by the officially registered OCC students or perspective students, instructor of record, guest lecturer, or substitute. Visitors are not permitted to be in the classroom and should not be invited to attend or participate in the class. See [FERPA](#) regulations for more information.

Use of AI Tools: This course requires you to complete various assignments that assess your understanding and application of the course content. You are expected to do your own work and cite any sources you use properly. You are not allowed to use any artificial intelligence (AI) tools, such as chatbots, text generators, paraphrasers, summarizers, or solvers, to complete any part of your assignments. Any attempt to use these tools will be considered academic misconduct and will be dealt with according to the Owens Community College academic integrity policy. Students are expected to complete all work independently and without the assistance of AI-generated content. If you have any questions about what constitutes acceptable use of AI tools, please consult with the instructor *before* submitting your work.

How Grades are Determined and Major Assignments

Evaluation Measure The grade points for the areas of work are as follows.	Student Learning Outcomes Assessed	Value
Quizzes (8 @ 30 points)	1-8	240 points
Class Participation	1-8	10 points
Total		250 points

The final course grade is to be computed using the following weights.

Evaluation Measure	Value	Student Learning Outcome Assessed
Class Participation:	4 %	1-8
Quizzes (8 quizzes):	96%	1-8

Grading Scale

Grade	Points
A	224-250
B	199-223
C	174-198
D	149-173
F	0-148

Grading Procedure:

Grades will be calculated on the following scale.

90% and Above	A
80% to Less than 90%	B
70% to Less than 80%	C
60% to Less than 70%	D
Less Than 60%	F

Tentative Class Assignments:

Week	SLO	Topic
1	1	Topic: Introduction to Computed Tomography Readings: Chapter 1, Module 1 Notes Quiz: Module 1 Test DATE
2	2	Topic: CT Scanner Instrumentation Readings: Chapter 2, Module 2 Notes Quiz: Module 2 Test DATE
3	3	Topic: CT Data Acquisition I Readings: Chapter 2, 5, Module 3 Notes Quiz: Module 3 Test DATE
4	4	Topic: CT Data Acquisition II Readings: Chapter 5, 3, Module 4 Notes Quiz: Module 4 Test DATE
5	5	Topic: CT Image Reconstruction and Post-Processing Readings: Chapter 3, 8, Module 5 Notes Quiz: Module 5 Test DATE
6	6	Topic: Digital Images and CT Image Display Readings: Chapter 4, 9, Module 6 Notes Quiz: Module 6 Test DATE
7	7	Topic: CT Image Quality, Artifacts, and Quality Control Readings: Chapter 6, 7, Module 7 Notes Quiz: Module 7 Test DATE
8	8	Topic: CT Radiation Dose and Safety Readings: Chapter 14, Module 8 Notes Quiz: Module 8 Test DATE

Disclaimer: The instructor reserves the right to amend this syllabus as deemed necessary and will communicate such amendment to the students in the course. Please note that while unlikely, there is a possibility courses might need to change the delivery method due to external issues like public health concerns, weather issues, etc. If this happens, the college will communicate any changes via email and/or other communication methods.