



RADS 4703: Principles of Computed Tomography

*Robert D. & Carol Gunn College of Health Sciences & Human Services
Department of Radiologic Sciences | Fall 2026*

Course Information

Course Name & Section	RADS 4703-X12 Principles of Computed Tomography
Credit Hours	3 Credit Hours
Academic Term	Fall 2026
Course Dates	August 24, 2026 – December 8, 2026
Class Meeting Times	Online (D2L)
Time Commitment	Students should expect to spend at least 9 hours per week on course material (15-week term).

Professor

Instructor	Kimberly Onstott, EdD, RT(R)(CT)(MR), MRSO(MRSC™) Assistant Professor, Radiologic Sciences
Office Location	Centennial Hall, Room 430Q Midwestern State University, 3410 Taft Blvd, Wichita Falls, TX 76309
Office Hours	Tuesdays 12:00 – 2:00 PM Wednesdays 12:30 – 2:00 PM Thursdays 12:00 – 2:00 PM (Please email to schedule appointments; Zoom or phone meetings available by request.)
Contact Information	Phone: (940) 397-4332 Email: kimberly.onstott@msutexas.edu

Email Communication	Email is the best contact method. Use this format in the subject line: 4703_your last name_topic of the message (e.g., 4703_Smith_Etymology question). Note: If I have not responded within 72 hours, please email me again.
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Course Description

This course examines the principles and methodologies of computed tomography (CT) imaging. It covers fundamental CT engineering, data acquisition, digital image display and quality, system upkeep, clinical optimization, radiation safety/dosimetry, cross-sectional anatomy, and clinical imaging procedures to prepare students for academic success and professional national registry standards.

Course Objectives

Upon completion of this course, the student will:

- Delineate the principles of CT engineering, including data acquisition, x-ray tube dynamics, and image reconstruction algorithms.
- Evaluate CT image display methodologies, postprocessing techniques, and image quality parameters.
- Implement system upkeep, quality assurance, and digital data management.
- Analyze patient preparation, assessment, communication, and safety protocols, including contrast agent dynamics and radiation dosimetry.
- Master the identification of central cross-sectional anatomy (neuroanatomy, thoracic, abdominopelvic, and musculoskeletal).
- Apply clinical imaging procedures, scanning parameters, and interventional CT techniques.

Course Materials

Textbook Requirements: Specific reading assignments are drawn from the course textbook (please refer to D2L for complete bibliographical and purchasing details). All core learning materials, modules, and lecture presentations are embedded within D2L.

Suggested Reference Material: American Psychological Association. (2020). Publication manual of the American Psychological Association (7th ed.). Washington, DC. ISBN: 978-1-4338-3216-1.

Computer Requirements

Taking an online class requires consistent, reliable access to a computer with high-speed internet, a functional webcam, and a microphone. It is your personal responsibility to secure access to a working computer for the duration of this class.

Important Accessibility & Software Warnings:

- **Chromebooks will NOT work:** Chromebook operating systems do not support the locked assessment and browser security protocols required for this course.
- **Web Browsers:** D2L is not fully compatible with legacy browsers like Internet Explorer. Use an updated browser (such as Chrome, Firefox, or Safari) to ensure course content loads properly.
- **Document Submission Formats:** Only Microsoft Word documents (.doc or .docx) will be accepted for assignment submissions. Submissions in Apple file formats (such as .pages or Keynote) will not be accepted. MAC users must explicitly save documents as Microsoft Word files before uploading.

Teaching Methodology/Class Activities and Assignments

This course is delivered fully online. Educational methods include independent reading assignments, structured study guides, interactive Desire2Learn (D2L) modules, optional learning activities to reinforce concepts, open-book module quizzes, special presentations, clinical case studies, virtual branching simulations, and a comprehensive, closed-book proctored final exam.

Important Dates and Course Schedule

The following schedule lists course milestones. Note that all assignments, quizzes, and discussion boards open on August 24, 2026. Weekly and modular activities are strictly due by 23:59 (11:59 PM) Central Standard Time (CST) on the designated dates below.

Module ID & Title	Associated Chapters	Project Milestones & Introductions	Graded Assessment Due (Tuesdays at 23:59)	Deadline Date (2026)
Module 1: Fundamental CT Engineering	• Ch 1: Basic Principles of CT • Ch 2: Data Acquisition • Ch 3: Image Reconstruction	• Course Orientation • Introduce: Online CT Trends Presentation	• Module 1 Quiz • POST: CT Trends Project -Topic Approval	September 08
Module 2: Managing the Digital Image	• Ch 4: Image Display • Ch 5: Methods of Data Acquisition • Ch 6: Image Quality	• Independent Research / Video Production	• Module 2 Quiz	September 22

Module ID & Title	Associated Chapters	Project Milestones & Introductions	Graded Assessment Due (Tuesdays at 23:59)	Deadline Date (2026)
Module 3: System Upkeep & Optimization	• Ch 7: Quality Assurance • Ch 8: Postprocessing • Ch 9: Data Management	• Introduce: Guided Clinical Case Study	• Module 3 Quiz • SUBMIT: Online CT Trends Presentation (10%)	October 06
Module 4: Patient Prep & Assessment	• Ch 10: Patient Communication • Ch 11: Patient Preparation • Ch 12: Contrast Agents	• Gather Case Study Data	• Module 4 Quiz • POST: CT Trends Peer Review	October 20
Module 5: Injection Dynamics & Patient Safety	• Ch 13: Injection Techniques • Ch 14: Radiation Dosimetry in CT	• Introduce: Virtual Branching Simulation	• Module 5 Quiz • SUBMIT: Guided Clinical Case Studies 1, 2, & 3 (5% each)	November 03
Module 6: Central Cross-Sectional Anatomy	• Ch 15: Neuroanatomy • Ch 16: Thoracic Anatomy • Ch 17: Abdominopelvic Anatomy	• Work on the Virtual Branching Simulation	• Module 6 Quiz	November 17
Module 7: Structural Anatomy & Neurologic Protocols	• Ch 18: Musculoskeletal Anatomy • Ch 19: Neurologic Imaging Procedures • Ch 20: Thoracic Imaging Procedures	• Complete Virtual Simulation & Log Event Steps	• Module 7 Quiz • SUBMIT: Virtual Simulation Table & Reflections (10%)	December 01

Module ID & Title	Associated Chapters	Project Milestones & Introductions	Graded Assessment Due (Tuesdays at 23:59)	Deadline Date (2026)
Module 8: Advanced Procedural Applications	• Ch 21: Abdomen and Pelvis Procedures • Ch 22: Musculoskeletal Procedures • Ch 23: Interventional CT & Fluoroscopy • Ch 24: PET/CT Fusion Imaging	• Shift to Comprehensive Registry Review	• Module 8 Quiz	December 08
Module 9: Course Wrap-Up & Evaluation	• Comprehensive National Registry Review	• No New Reading Assignments	• COMPREHENSIVE FINAL EXAM (30%)	December 08 (Opens Friday, Dec 04)

The instructor may change this syllabus, assignments, and schedule at their discretion with advance notice.

Evaluation

Grade Distribution

Assessment Category	Weight toward Final Grade
Module Quizzes (8 quizzes at equal weight)	35%
Online CT Trends Presentation	10%
Guided Clinical Case Study	15%
Virtual Simulation Event Table & Reflections	10%
Proctored D2L Comprehensive Closed-Book Final Exam	30%

Grade Scale

Final Course Average	Letter Grade Assigned
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90% – 100%	A
80% – 89%	B
70% – 79%	C
60% – 69%	D
59% and below	F

CRITICAL RADIOLOGY PROGRAM GRADE REQUIREMENT:

Students must maintain a final course average of 'C' (70%) or above to receive credit in the Radiologic Sciences program. A letter grade of 'D' or 'F' cannot be used for graduation and will require the student to repeat this course in accordance with the current department and program policies.

Pacing for Success: Student Guide

This course has been built using specialized pacing constraints to help you balance your heavy clinical workload, prevent last-minute cramming, and support long-term retention for your ARRT national registry exam. Use these structural controls to map out your semester calendar:

- **The Two-Week Assignment Rhythm:** Notice that major assignments are introduced exactly one module before they are due. Do not wait until the active submission module to begin. Use the "Introduction week" to read the grading rubric, review templates, or gather patient records so you can pace out your efforts easily.
- **Navigating the Thanksgiving Buffer (Module 7):** Module 7 runs from November 17 to December 01, spanning across Thanksgiving week. This 2-week block gives you extra breathing room to tackle the intensive 2-to-4 hour Virtual Branching Simulation without ruining your holiday. Plan to look over the virtual simulations before the holiday week and download the associated worksheet, log your simulation runtime over the long weekend, and save your write-up for the final days.
- **The Module 8 Sprint:** Module 8 transitions to a 1-week turnaround (December 01 to December 08). While it covers 4 distinct chapters, they are entirely based on practical clinical imaging protocols rather than complex physics equations. Because you already mastered the underlying anatomy in Modules 6 and 7, you will find these chapters read very quickly. Budget a little time every single night this week to skim through the scanning ranges and parameters.
- **The Final Exam Approach Window:** Your final exam window closes on Tuesday, December 08 at 23:59. To give you maximum control over your schedule, the D2L testing environment will unlock early on Friday, December 04. It is highly recommended to complete your final module quiz early in the week, spend your weekend treating the final exam like your real ARRT registry run, and clear your plate before the absolute deadline.

Grading Cycle

All assignments are graded as a collective cohort to guarantee maximum evaluation consistency. Grading begins on the first business day following a scheduled due date (excluding

university holidays and academic/professional conferences) and is typically finalized prior to the next course milestone. Progress can be monitored via the D2L Gradebook.

Extra Credit Policy

In accordance with standard program equity guidelines, no extra credit assignments, alternative assessments, or bonus-point tasks are offered in this course. Your grade is based strictly on the evaluated criteria outlined above.

Student Feedback

Course-wide guidance and feedback will be regularly distributed via the News section of D2L. It is your responsibility to configure your D2L settings to receive instant notifications of newly posted course announcements. Direct, individualized inquiries are welcome via email. Common or repetitive student inquiries will be addressed and archived in the D2L News feed so the entire class can benefit from the clarification.

Attendance Policy

This is an entirely online course. Traditional physical attendance is not tracked. Instead, attendance is evaluated by your active, weekly engagement with the course: specifically, regular logins to D2L, completion of modules, and active communication. Missing deadlines, failing to participate in discussions, or remaining inactive in D2L for consecutive days may negatively impact your final grade, or result in an administrative drop following a formal academic warning from the instructor.

Late Work

Due Dates

Course deliverables must be uploaded on Tuesdays (with exceptions noted on the syllabus) by 23:59 (11:59 PM) CST. Missed deadlines without prior approval will receive an immediate grade of zero (0) for that assignment.

Progression

Each assignment in this course is built on the previous assignment. Therefore, if you have not completed an assignment, you must consult with the professor if you miss an assignment due date.

Emergency Extensions

If you experience an emergency or a major, documented life disruption (such as hospitalization, severe personal illness, or a death in the immediate family), contact the professor via email (kimberly.onstott@msutexas.edu) as soon as possible, on or before the due date. Standard emergency extensions typically grant up to one (1) week of additional time with no penalty. After

that one-week window has expired, a deduction of ten (10) points per day will apply. To maintain compliance with institutional reporting requirements, all course submissions must be finalized at least one full week prior to the official end-of-semester grade posting deadline.

Alternate Discussion Assignments

If emergency circumstances completely prevent your participation in collaborative, time-sensitive D2L discussion boards, the instructor may, at their discretion, assign an alternate individual research project of equal weight.

Submission Policy

All student uploads to the D2L Dropbox are evaluated as final submissions. It is your sole responsibility to ensure that the correct, completed, and uncorrupted document file has been uploaded. If you upload an incomplete draft, an incorrect file, or an unapproved file format, the document will be graded exactly as submitted.

Technical Difficulties

If you encounter an unexpected system-wide glitch (such as a documented, university-wide D2L server outage), the instructor will announce a course-wide extension. However, localized, personal computer problems (such as home internet loss, a frozen computer, or broken devices) are not acceptable excuses for missing a deadline. You must utilize backup access routes (including campus computer labs, mobile hotspots, or alternative public internet locations) to submit your assignments. If an emergency computer problem occurs, email your completed assignment to the instructor's personal inbox immediately to establish a date-stamp before the deadline passes.

HIPAA Requirement

Confidentiality and Student Compliance: To remain compliant with federal law, you must protect patient privacy. Under no circumstances should any actual patient name, medical facility name, or identifying information appear on your coursework. Any proper name, institution name, or patient identifier other than your own name will be flagged as an immediate HIPAA violation. Depending on the severity, violations will result in an immediate drop in the assignment grade, potentially to a permanent grade of zero (0).

Honor System

Students enrolled in RADS 4703 are expected to maintain the highest standards of academic honesty and ethical conduct. Any student work submitted in this course must represent that student's own individual intellectual effort. Cheating, unauthorized collaboration, or acquiring course exams/materials without express permission from the faculty will be treated as direct

violations of the Midwestern State University Code of Student Conduct, subject to administrative referral and disciplinary action.

Plagiarism

Plagiarism in any form—including paraphrasing or quoting source material without clear, accurate text citation and reference lists, submitting papers purchased from writing services, or recycling work previously submitted for credit in other courses—is strictly prohibited. All coursework is subject to automated similarity analysis using an online plagiarism service. Assignments containing plagiarized material will receive an immediate, non-negotiable grade of zero (0) for the task, and serious or repeat offenses will be forwarded to the Dean of Students for university-wide disciplinary review and potential suspension.

Artificial Intelligence (AI) Usage Policy

The use of generative Artificial Intelligence tools (such as ChatGPT, Claude, Gemini, or similar software) is permitted in this course only under the following strict conditions:

- **Research & Sourcing Limitations:** AI tools may be used solely for preliminary brainstorming and topic exploration. To ensure scholarly rigor, at least 50% of the sources cited in any assignment must be retrieved directly from the MSU Moffett Library peer-reviewed databases.
- **Writing & Content Restrictions:** AI usage in the writing phase is strictly limited to spelling, grammar, and syntax correction. AI tools are absolutely prohibited from generating content, arguments, analytical paragraphs, or the body text of any writing assignment, discussion board contribution, or course project.
- **Source Verification Protocol:** To verify research authenticity, students must be prepared to submit full PDF copies of all cited sources upon request. For specific assignments, you will be required to copy and paste the precise source text and page numbers from which your information was derived.
- **Academic Consequences:** Any violation of these guidelines will be treated as a major violation of academic integrity, resulting in an immediate grade of zero (0) for the assignment. Egregious or repeat offenses may result in a failing grade ('F') for the overall course.

Classroom Recording Policy

Recording Policy: Recording class lectures, virtual discussions, or course presentations is strictly prohibited without the instructor's explicit, prior written permission. When authorized, recordings are for the student's personal educational use only and may not be uploaded to the internet, published, or shared. Students with approved ADA accommodations from Disability Support Services may record classes following DSS procedures, but these recordings must also remain private and unshared.

Intellectual Property

Intellectual Property rights: By enrolling in this course, students grant Midwestern State University a limited, non-exclusive right to all student-created coursework. This includes the

right to reproduce and submit assignments to external verification services to authenticate originality and detect plagiarism.

Student Well-Being & Support Resources

Your physical health, mental well-being, and access to basic needs are critical to your success in this course. College life can be highly demanding, and unexpected personal setbacks happen. I strongly encourage you to prioritize self-care and reach out to me, your academic advisor, or other campus experts as soon as a challenge arises so we can help you find pathways to succeed.

The following dedicated student support services stand ready to assist you:

Mental Health & Counseling Support

- **Counseling Center:** Professional, confidential mental health services are available on campus. Call (940) 397-4618 to schedule an appointment.
- **BetterMynd:** Free virtual counseling sessions are available for students seeking mental health support, including convenient evening and weekend appointments.

Basic Needs & Emergency Aid

- **Basic Needs Emergency Aid:** If you experience sudden, unexpected challenges meeting your basic needs—such as housing, food, utilities, transportation, healthcare, technology, or textbooks—emergency support programs may be available. Visit the Student Emergency Support and Resources webpage to explore options.
- **Office of Student Affairs:** For help navigating emergency aid and basic needs support, contact the Office of Student Affairs located in the Clark Student Center, Room 108. Phone: (940) 397-7500 | Email: student.affairs@msutexas.edu.

Services for Students with Disabilities

In accordance with Section 504 of the Federal Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, Midwestern State University is committed to providing equal educational opportunities and reasonable accommodations for qualified students with disabilities.

Students requiring accommodations must register with Disability Support Services (DSS), located in the Student Wellness Center. To initiate services, contact DSS at (940) 397-4140 to schedule an intake. Current professional documentation of a disability is required to establish accommodations, and each student request is reviewed individually to ensure appropriate, customized support is provided.

Moffett Library Resources

Moffett Library provides essential research resources and academic services to support your coursework. Students can access academic books, peer-reviewed journals, scholarly databases, and multimedia materials both on campus and remotely. The library also provides media equipment checkouts, reservable group study rooms, and individual research assistance from professional librarians. Visit the Moffett Library webpage to learn how to access and utilize these resources.

Administrative Process

Unresolved issues related to this course should be first addressed between the student and the course professor. If there is no resolution, students must follow this administrative sequence:

- **Department Chair:** Dr. Lynette Watts | Phone: (940) 397-4833
- **College Dean:** Dr. Jeff Killion | Phone: (940) 397-4594
- **Dean of Students:** Matthew Park | Phone: (940) 397-7500

Administrative Policies, Grade Appeals, & Schedules

Grade Appeal Process

Students who wish to formally appeal an evaluated course grade must consult the guidelines and procedural deadlines published in the official Midwestern State University Undergraduate Catalog.

Change of Schedule Policy

A student who drops a course (but does not fully withdraw from the University) within the first twelve (12) class days of a regular semester, or within the first four (4) class days of a summer term, is eligible for a 100% refund of applicable tuition and fees. Drop deadlines are published in the University Schedule of Classes each semester.

Refund and Repayment Policy

Students who withdraw or are administratively withdrawn from the University may be eligible for a full or partial refund of tuition, fees, and room/board. However, students receiving federal, state, or institutional financial aid (including grants, student loans, or scholarships) may have a portion of their refund returned directly to the financial aid programs under federal and state compliance formulas. Detailed refund calculation examples are available from the university upon request.

Senate Bill 11 / House Bill 1927 (Campus Carry)

Campus Carry

Effective August 1, 2016, Texas Senate Bill 11 allows licensed individuals to carry a concealed handgun in public university buildings, except in designated prohibited zones established by the University. Under current Texas law, concealed carry requires a valid License to Carry (LTC) permit. The open carrying of handguns is strictly prohibited on college campuses. For complete guidelines and prohibited areas, visit the MSU Campus Carry webpage.

Active Shooter Emergency Response

The safety of our campus is a shared responsibility. All members of the university community must remain prepared to respond appropriately to active threats. Review the crisis guidelines and training materials provided by the MSU Police Department at MSUReady - Active Shooter. Students are strongly encouraged to watch the 'Run. Hide. Fight.' training video, which can be accessed on the university police website.

If you have questions, concerns, or safety inquiries, please contact MSU Chief of Police Steven Callarman directly at: steven.callarman@msutexas.edu

Campus Closure Policy

In the event of a campus closure due to severe weather, power grid issues, or other unscheduled disruptions, the online course schedule and assignment due dates will remain unchanged. If a major storm or regional power outage prevents you from accessing the internet, utilize whatever emergency communication method is available to contact the professor as soon as possible (e.g., telephone message, email via phone data, or a peer's communication device).

Tobacco, Alcohol, & Drug Compliance Policies

Smoking & Tobacco Policy

University policy strictly prohibits the use of tobacco, e-cigarettes, and vapor products in any building owned, leased, or operated by Midwestern State University. Tobacco use is restricted solely to designated outdoor smoking areas.

Alcohol & Drug Policy

To comply with the Drug-Free Schools and Communities Act of 1989 and subsequent amendments, Midwestern State University strictly enforces policies that prohibit the unlawful possession, use, or distribution of illicit drugs and alcohol on university property or as part of any university-sponsored activity. Violators are subject to severe university disciplinary sanctions and standard legal penalties under local, state, and federal laws.

Communicating with the Professor

Direct contact information is listed at the top of this syllabus. The instructor strongly prefers email communication as it creates a reliable, documented paper trail. Always send messages from your official university account. When there is a need to contact you individually, the professor will use your official MSU email (students.mwsu.edu). The instructor is not responsible for messages missed due to forwarding errors or unchecked personal email accounts.

Official Response Window

The professor will respond to or acknowledge all student emails within 72 hours. If the professor is away at an academic conference or out of office, a news announcement will be posted in D2L outlining alternative contact protocols or temporary grading delays. Please respect this 72-hour window before resending your email request.