

RADS 3773 Radiation Biology and Protection

Gunn College of Health Sciences and Human Services
The Shimadzu School of Radiologic Sciences
Fall 2026

Contact Information

Mandy Sedden MSRS, RT(R) Assistant Professor

Email: mandy.sedden@msutexas.edu

- Email is the best way to reach me. If I have not responded within 72 hours, please email me again.
- Use this information in the subject line: 3773_your last name_topic of the message.
- Example: 3773_Sedden_Quiz 1

Office Location: Midwestern State University
3410 Taft Blvd., Centennial Hall 430M
Wichita Falls, TX 76308

Phone: (940) 397-4664

Office Hours: Please make an appointment.

Course Description

This course offers an advanced study of radiobiology and radiation protection. Topics include interactions of radiation with matter, biologic effects of ionizing radiation, quantities and units of measurement, dose response curves, and patient and personnel protection.

Course Objectives

Upon completion of this course, the student will:

- Explain the effects of radiation exposure on biological systems.
- Describe the biophysical mechanisms of radiation damage and the somatic and genetic effects of radiation exposure on humans.
- State typical dose ranges for routine radiographic procedures.
- Explain basic methods and instruments for radiation monitoring, detection, and measurement.
- Identify methods for protecting personnel and patients from excessive radiation exposure.
- Apply appropriate radiation protection practices.

Teaching Methodology

This course is taught using an online methodology. There will be reading assignments, tests, class discussion boards, an individual project, and a closed-book proctored final examination.

Textbook & Instructional Materials

Required – Textbook

Sherer, M.A., Visconti, P.J., Ritenour, E.R., & Haynes, K.W. (2022). Radiation protection in medical radiography (9th ed.). Elsevier. [ISBN: 978-0-3238-2503-0]

Required – APA Manual

American Psychological Association. (2020). Publication manual of the American Psychological Association (7th ed.). [ISBN: 978-1-4338-3216-1]

Calculator:

TI-30XIIS Scientific Calculator or TI-30Xa Scientific Calculator. Instructions for use are provided in the course documents. The instructor may not be able to help with other calculator models. Only these two calculators are approved for use on the comprehensive final exam.

Computer Requirements

- Students must have access to a Windows or Mac compatible computer. Chromebooks are not compatible with the University's proctoring software.
- Google Chrome or Mozilla Firefox is recommended as your default browser for D2L — this eliminates most issues seen with Internet Explorer, Safari, or other browsers.
- Students must have reliable computer and internet access. All students must have a webcam and microphone — no exceptions.

Course Communication

Contact information for the instructor is listed at the beginning of this syllabus. Email is the preferred mode of communication. Students must use their standardized MSU Student email for correspondence about this course. When emailing the instructor, you must use the following subject header:

3773_your last name_topic of message

Example: 3773_Sedden_Quiz 4

When there is a need to contact students, the instructor will use the student's MWSU email account, students@msutexas.edu. The instructor is not responsible for sending emails to any other email account. Faculty members will not be responsible for keeping up with other email addresses for students. If you have not established this account, do so as soon as possible by going to: <http://infosys.mwsu.edu/email.asp>

The instructor will respond or at least acknowledge email messages from students within a maximum of five (5) business days when MSU is in session. MSU is open only 4 days a week in the summer, so be mindful that if you email the instructor on a Friday you might not get a response until Monday. Beyond standard university holidays and breaks, the instructor will notify students of any extended periods of time when email contact is not practical (professional

meetings, etc.). I will meet face-to-face with any interested students by appointment only. This meeting is optional and must be confirmed by email ahead of time with me.

Setting Up Notifications

Steps to forward D2L email to another email address:

1. Click on the **Envelope Icon** in the top menu bar.
2. Click **Email**.
3. Click **Settings** in the top right corner of the inbox.
4. Scroll down to **Forwarding Options** and type in the new email or uncheck the box to turn forwarding off.
5. Click **Save**.
6. Remember to go to the new email and click to verify the email address.

Steps to forward News item notifications to email or SMS:

1. Select your name in the upper right-hand corner to open the menu.
2. Select the “Notifications” link.
3. In the Instant Notifications heading for News, select the box next to the items for which you would like to receive notifications. (There should be a blue check mark when selected.)
4. Click the Save button on the bottom of the screen to save any changes made.

NOTE: If there are boxes already selected with blue check marks, this indicates that you are currently subscribed to that item.

Academic Misconduct Policy & Procedures

Academic Dishonesty includes cheating, collusion, and plagiarism (using another person's source material, published or unpublished, without proper credit, or submitting work for credit that is not your own). Additional procedural guidelines are available through the Office of Student Conduct.

By enrolling in this course, you grant MSU a limited right to all intellectual property you create for this course — including the right to reproduce your work to verify originality and authenticity, and for educational purposes. Faculty may submit student work to an external service to check for plagiarism.

Refer to: [Office of Student Conduct](#)

Moffett Library

Moffett Library provides books, peer-reviewed journals, databases, and multimedia resources — accessible both on campus and remotely — along with media equipment checkout, reservable study rooms, and research help from librarians. Get started on the Moffett Library website (msutexas.edu/library).

Grading

Table 1: Assignment Weighting

Assignment	Percentage
Module Tests	30%
Radiologic Incident PowerPoint Course Project	20%
Radiologic Incident Discussion Boards	20%
Comprehensive Final Exam	30%
Total	100%

Table 2: Letter Grade Scale

Grade	Points
A	90–100
B	80–89
C	70–79
D	60–69
F	59 and below

Course Modules

- Module 1: Introduction & Interaction of X-Radiation with Matter
- Module 2: Radiation Quantities & Units and Radiation Monitoring
- Module 3: Overview of Cell Biology and Molecular & Cellular Radiation Biology
- Module 4: Early & Late Radiation Effects on Organ Systems
- Module 5: Dose Limits for Exposure to Ionizing Radiation, Equipment Design for Radiation Protection, and Radioisotopes & Radiation Protection
- Module 6: Management of Patient & Imaging Personnel Radiation Dose during Diagnostic X-Ray Procedures

Module Tests (30%)

There are six module tests, each 30 minutes with 25 multiple-choice questions, using the Respondus LockDown Browser. A required practice test confirms your computer is working before you take the Module 1 test — take it as many times as needed. Students scoring below 70 on a module test are given a second attempt; the average of both attempts becomes the recorded grade. Questions are drawn randomly from a large pool, so each test will differ somewhat. See the course schedule for due dates.

Late assignments are considered case by case (see Student Responsibilities below).

Radiologic Incident PowerPoint Course Project (20%)

Select one radiologic incident from the database in D2L and prepare a narrated PowerPoint presentation. See the course content for complete instructions on what to include and how to record your narration.

Radiologic Incident Discussion Board Participation (20%)

You will participate in two discussion boards, each based on a specific article. Discussion Board 2 also requires a peer response to a classmate's post. See the course content for complete instructions on what to include in each post and the outside research expectations.

***All discussions must be submitted by the published due date — because discussion boards depend on timely participation from everyone, no late submissions are accepted.**

Comprehensive Final Examination (30%)

All quizzes and projects must be completed before taking the final exam. Incomplete final exams are scored zero and result in failing the course. Contact the instructor immediately if extenuating circumstances will cause you to miss the window — acceptance is at the instructor's discretion, and given the exam's extended availability, only extraordinary circumstances will be considered.

***The final uses Respondus LockDown Browser with webcam.** A practice test must be completed before taking the final.

Exam format:

- Proctored, closed-book, 100 randomly selected multiple-choice questions
- Timed: 2 hours (120 minutes)
- Covers the entire course — review all quizzes, textbook chapters, and PowerPoint materials to prepare

What to bring:

- One sheet of blank scratch paper
- A non-programmable scientific calculator (see approved models above)
- No smart watches or other electronic devices
- No printing of the exam
- No textbooks or notes

A final course score of 70% is required to pass. Letter grades of D or F cannot be used for graduation and will require the course to be repeated according to the current radiology program policy.

Student Responsibilities

Due Dates:

All work must be submitted by 11:59 pm Central time on the scheduled due date. Late work is considered case by case — contact the instructor immediately if you cannot meet a deadline. Late submissions may not be graded without prior approval.

Emergency Extension:

For a major event such as a death in the family, illness, hospitalization, or other extenuating circumstance, email as soon as possible, on or before the due date. Extensions are granted individually.

Submissions:

Use baccalaureate-level writing: complete sentences, correct grammar, proper punctuation. All work is graded for accuracy, completeness, quality, spelling, grammar, and integrity. Submit in Times New Roman or Arial, 12-point font, through the appropriate D2L dropbox.

All submissions are final. It's your responsibility to confirm the correct, complete file was uploaded; incorrect documents, incomplete drafts, or unintended versions will be graded as submitted. Double-check your upload before finalizing.

File formats:

Apple file formats (.pages, Keynote) are not accepted. Submit in Microsoft Office formats (.doc, .docx, .ppt, .xlsx) unless otherwise specified.

Important Dates

- Last day for term schedule changes: [Academic Calendar](#)
- Last day to drop with a grade of "W": [Academic Calendar](#)
- Refer to: [Drops, Withdrawals & Void](#)

Attendance

As an online course, there are no mandatory face-to-face sessions — but you should check D2L regularly to receive instructor messages in a timely manner. This course follows a strict schedule; see the course schedule for specific activities and due dates. Optional meetings with the instructor can be arranged by email in advance. Check for class announcements on the D2L course website.

Online Computer Requirements

Personal computer or technical difficulties are not grounds for a deadline extension. You are responsible for having (or having access to) a working computer with internet access. Classes can be accessed from any internet-connected computer in the world. Contact your instructor immediately if you have technical trouble, and use the student helpdesk through D2L for technical support (the college cannot work directly on student computers due to liability and resource limits).

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, MSU makes reasonable accommodations to ensure equal opportunity for qualified students with disabilities. After acceptance, students requiring accommodations should apply through Disability Support Services, located in the Student Wellness Center, (940) 397-4140. Current documentation is required, and each request is reviewed individually. For more details, please go to [Disability Support Services](#).

College Policies

Smoking/Tobacco Policy: College policy strictly prohibits the use of tobacco products in any building owned or operated by WATC. Adult students may smoke only in the outside designated-smoking areas at each location.

Alcohol and Drug Policy: To comply with the Drug Free Schools and Communities Act of 1989 and subsequent amendments, students and employees of Midwestern State are informed that strictly enforced policies are in place which prohibits the unlawful possession, use or distribution of any illicit drugs, including alcohol, on university property or as part of any university-sponsored activity. Students and employees are also subject to all applicable legal sanctions under local, state and federal law for any offenses involving illicit drugs on University property or at University-sponsored activities.

Campus Carry : Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes has prohibited. The new Constitutional Carry law does not change this process. Concealed carry still requires a License to Carry permit, and openly carrying handguns is not allowed on college campuses. For more information, visit [Campus Carry](#).

Active Shooter: The safety and security of our campus is the responsibility of everyone in our community. Each of us has an obligation to be prepared to appropriately respond to threats to our campus, such as an active aggressor. Please review the information provided by MSU Police Department regarding the options and strategies we can all use to stay safe during difficult situations. For more information, visit [MSUReady – Active Shooter](#). Students are encouraged to watch the video entitled “*Run. Hide. Fight.*” which may be electronically accessed via the University police department’s webpage: [“Run. Hide. Fight.”](#)

Grade Appeal Process

Students wishing to appeal a grade should consult the MSU Catalog. Unresolved issues related to this course should first be addressed directly with the instructor. If unresolved, follow this sequence:

1. Department Chair – Dr. Lynette Watts (940-397-4611)
 2. College Dean – Dr. Jeff Killion (940-397-4679)
 3. Dean of Students – Matthew Park (940-397-7500)
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Course Schedule

Notice: Changes to the syllabus, procedures, assignments, or schedule may be made at the instructor's discretion.

Everything is listed here in the order it's due, so you can see what's coming up next at a glance.
All due times are 11:59 pm Central unless noted otherwise.

Due Date	Assignment
Monday, August 24	Class opens – review course syllabus
Monday, Sept 7	Module 1 Test
Monday, Sept 14	Discussion Board 1 (Marie Curie) – original post due
Monday, Sept 21	Module 2 Test
Monday, Oct. 5	Module 3 Test
Monday, Oct. 12	Discussion Board 2 (Patient Shielding) – original post due
Monday, Oct. 19	Module 4 Test Discussion Board 2 (Patient Shielding) -response due
Monday, Nov.2	Module 5 Test
Monday, Nov 16	Module 6 Test
Monday, Nov.30	Radiologic Incident PowerPoint Course Project due
Monday, Nov 23	Final Exam opens
Friday, Dec.4	Final Exam closes