



RADS 3773-X20 Radiation Biology and Protection (online)

Gunn College of Health Sciences and Human Services

The Shimadzu School of Radiologic Sciences

Fall 2026

Contact Information

Instructor: Debra Wynne, MSRS, RT(R)

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Office hours: By appointment

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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

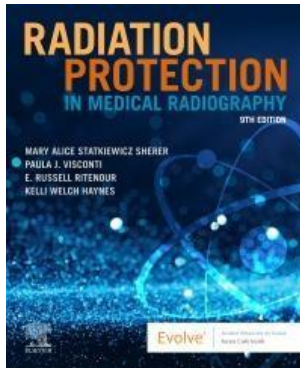
This course is taught using an online methodology. There will be reading assignments, tests, class discussion boards, an individual project, and a closed book proctored final examination.

Textbook & Instructional Materials

Textbooks

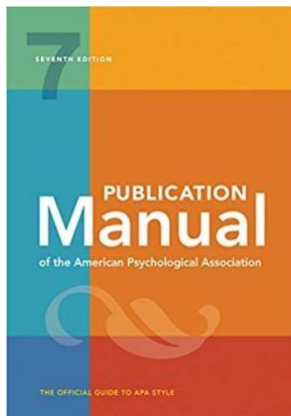
Required

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

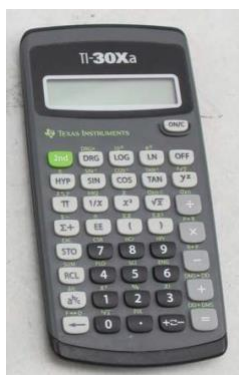
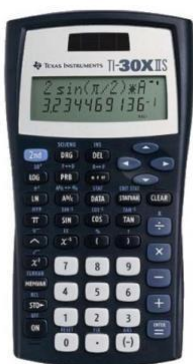


Required

American Psychological Association. (2020). *Publication manual of the American Psychological Association* (7th Ed.). Washington, DC: Author. [ISBN 978-1-4338-3216-1]



TI-30XIIS Scientific Calculator **-or-** TI-30Xa Scientific Calculator



Instructions are provided in the course documents on how to use these calculators for some of the advanced math problems. **The instructor may not be able to help you with other types of calculators. These two calculators are approved for use on the comprehensive final examination.**

Computer Requirements

Students must have access to Windows or MAC compatible computers (no Chromebooks). Chromebooks do not work with the proctoring software provided by the University.

It is recommended students download Google Chrome or Mozilla Firefox to use as the default browser for all D2L courses. This appears to eliminate most technical issues encountered with Internet Explorer, Safari, or any other browser.

Students must have reliable computer and internet access. ALL STUDENTS MUST HAVE A WEBCAM AND MICROPHONE – NO EXCEPTIONS!

Communication with the Instructor

Communication will be through the student's @my.msutexas.edu email account. Email is the preferred mode of communication. 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. 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.).

When emailing the instructor, please include your full name, course and section number, and a thorough explanation in your message. This will help expedite your request or needs.

Students should also check the 'News' section within D2L for course updates and other important information.

Student Handbook

Refer to: [Student Handbook](#)

Academic Misconduct Policy & Procedures

Academic Dishonesty: Cheating, collusion, and plagiarism (the act of using source material of other persons, either published or unpublished, without following the accepted techniques of crediting, or the submission for credit of work not the individual's to whom credit is given). Additional guidelines on procedures in these matters may be found in the Office of Student Conduct.

Please note: By enrolling in this course, the student expressly grants MSU a "limited right" in all intellectual property created by the student for the purpose of this course. The "limited right" shall include, but shall not be limited to the right to reproduce the student's work/project in order to verify originality and authenticity, and for educational purposes. Specifically, faculty may submit student papers and assignments to an external agency to verify originality and authenticity, and to detect for plagiarism.

[Office of Student Conduct](#)

Moffett Library

Moffett Library provides resources and services to support student's studies and assignments, including books, peer-reviewed journals, databases, and multimedia materials accessible both on campus and remotely. The library offers media equipment checkout, reservable study rooms, and research assistance from librarians to help students effectively find, evaluate, and use information. Get started on this [Moffett Library webpage](#) to explore these resources and learn how to best utilize the library.

Grading

Table 1: Percentage allocated to assignments

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

Table 2: Total points for final grade.

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

Assignments

There are four types of assignments in this course. The grading will be as follows:

1. Module Tests
2. Radiologic Incident PowerPoint Course Project
3. Radiologic Incident Discussion Boards
4. Comprehensive Final Exam (proctored)

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 test is 30 minutes long with 25 multiple-choice questions. The Respondus Lockdown Browser is used for all Module Tests. There is a required practice test you will need to take to ensure your computer is working properly before you can take the Module One Test. You may take the practice test as many times as you need. For students scoring below a 70, a second attempt will be given; however, the average of the two grades will be recorded in the gradebook as the final grade for that Module exam. Please note: exam questions are selected randomly from a large question pool, so each test will be different (some questions may be the same). For the due dates, please refer to the schedule in D2L and this syllabus. * **Late assignments will be accepted on a case by case basis (see Student Responsibilities section of this syllabus).**

Radiologic Incident PowerPoint Course Project (20%)

For this project you will be selecting one of the radiologic incidents from a database on D2L and preparing a narrated PowerPoint presentation. Please read the course content for complete instructions. In the online instructions you will find what should be included in your PowerPoint and how to record your narration.

Radiologic Incident Discussion Board Participation (20%)

You will participate in two discussion boards, each based upon 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 (see the course calendar).**

*** Because discussion boards depend upon timely participation from everyone, no late submissions are accepted.**

Comprehensive Final Examination (30%)

All quizzes and projects must be completed before the Final Exam is taken.

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 examination uses Respondus Lockdown Browser with Webcam. A practice test must be completed before taking the final examination.

Exam Format

- Proctored, closed book, 100 randomly selected multiple-choice questions
- Timed: 2-hours (120 min)
- 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 any other electronic devices
- No printing of the exam
- No textbooks or notes

Final Exam

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

Extra Credit

There are no extra credit opportunities in this course.

Student Responsibilities

As a student enrolled in this course, you will be responsible for adhering to and meeting posted deadlines and due dates. All activities for this course are listed at the end of this syllabus.

Due Dates

All work must be submitted by 11:59 pm CST 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 is 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: August 27, 2026. Check date on [Academic Calendar](#).
- Deadline to file for graduation: October 5, 2026. Check date on [Academic Calendar](#).
- Last Day to drop with a grade of "W:" November 23, 2026. Check date on [Academic Calendar](#).
- Refer to: [Drops, Withdrawals & Void](#)

Desire-to-Learn (D2L)

Extensive use of the MSU D2L program is a part of this course. Each student is expected to be familiar with this program as it provides a primary source of

communication regarding assignments, examination materials, and general course information. You can log into [D2L](#) through the MSU Homepage. If you experience difficulties, please contact the technicians listed for the program or contact your instructor.

Attendance

Since this is an online course, there are no mandatory face-to-face sessions. However, the student should be vigilant in logging into D2L. Regular checks will ensure messages from the instructor are received in a timely manner. This course is on a schedule that will be strictly adhered to. See the course schedule at the end of this syllabus for specific information about activities and due dates. The instructor will be available to meet with any interested students. This meeting is optional and must be confirmed by email ahead of time with the instructor. Students should check for class announcements on the course website in D2L.

Online Computer Requirements

Taking an online class requires you to have access to a computer (with Internet access) to complete and upload your assignments. It is your responsibility to have (or have access to) a working computer in this class. ****Assignments and tests are due by the due date, and personal computer technical difficulties will not be considered reason for the instructor to allow students extra time to submit assignments, tests, or discussion postings. *Your computer being down is not an excuse for missing a deadline!!*** There are many places to access your class! Our online classes can be accessed from any computer in the world which is connected to the internet. Contact your instructor immediately upon having computer trouble. If you have technical difficulties in the course, there is also a student helpdesk available to you. The college cannot work directly on student computers due to both liability and resource limitations; however, they are able to help you get connected to our online services. For help, log into [D2L](#).

Change of Schedule

A student dropping a course (but not withdrawing from the University) within the first 12 class days of a regular semester or the first four class days of a summer semester is eligible for a 100% refund of applicable tuition and fees. Dates are published in the Schedule of Classes each semester.

Refund and Repayment Policy

A student who withdraws or is administratively withdrawn from Midwestern State University (MSU) may be eligible to receive a refund for all or a portion of the tuition, fees, and room/board charges that were paid to MSU for the semester. HOWEVER, if the student received financial aid (federal/state/institutional grants,

loans and/or scholarships), all or a portion of the refund may be returned to the financial aid programs. As described below, two formulas (federal and state) exists in determining the amount of the refund. (Examples of each refund calculation will be made available upon request).

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 endeavors to make reasonable accommodations to ensure equal opportunity for qualified persons with disabilities to participate in all educational, social, and recreational programs and activities. After notification of acceptance, students requiring accommodations should make application for such assistance through Disability Support Services, located in the Student Wellness Center, (940) 397-4140. Current documentation of a disability will be required in order to provide appropriate services, and each request will be individually reviewed. For more details, please go to [Disability Support Services](#).

College Policies

Campus Carry Rules/Policies

Refer to: [Campus Carry Rules and 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 who wish to appeal a grade should consult the Midwestern State University [MSU Catalog](#)

Unresolved issues related to this course should be first addressed between you and me. If there is no resolution, you must 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)

Course Schedule:

***Notice:** Changes in the course syllabus, procedure, assignments, and schedule may be made at the discretion of the instructor.

Due Date	Activities/Assignments/Exams
Monday, August 24	Class opens - Review course syllabus
Monday, September 7	Module 1 Test
Monday, September 14	Discussion Board 1 (Marie Curie) – original post
Monday, September 21	Module 2 Test
Monday, October 5	Module 3 Test
Monday, October 12	Discussion Board 2 (Patient Shielding) – original post due
Monday, October 19	Module 4 Test Discussion Board 2 (Patient Shielding) – response due
Monday, November 2	Module 5 Test
Monday, November 16	Module 6 Test
Monday, November 23	Final Exam opens
Monday, November 30	Radiologic Incident PowerPoint Course Project due
Friday, December 4	Final Exam closes