



*Gunn College of Health Sciences and Human Services  
The Shimadzu School of Radiologic Sciences  
Bachelor of Science, Radiologic Sciences Program  
Course Syllabus - Melanie Billmeier*

**RADS 3773 Radiobiology & Protection**

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## Course Description

A study of the theories and principles of the interactions of ionizing radiation with biological systems, acute and long-term effects of ionizing radiation exposure, typical medical exposure levels, methods for measuring and monitoring radiation, and methods for protecting personnel and patients from excessive exposure in both the diagnostic and therapeutic settings.

## Student Learning Outcomes

By the conclusion of the course, the successful student should be expected to:

- 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.

Unit objectives are located at the beginning of each chapter of the text.  
Please utilize these to assist you in your study of the unit materials.

## Course Materials:

Statkiewicz-Sherer, M.A., Visconti, P. J., Ritenour, E. R., & Haynes, K. W. (2018). Radiation protection in medical radiography (8th ed.). St. Louis, MO: Elsevier Mosby.

-MSU Bookstore price \$75.99 (e-book)

## Additional resources: (supplement textbook)

American Psychological Association. (2020). Publication manual of the American Psychological Association (7th ed.). Washington, DC: American Psychological Association. [ISBN 978-1-4338-0561-5]

-MSU Bookstore price \$31.99+

A scientific calculator is highly recommended.

## Course Evaluation Methods

# of Graded Course Elements	Graded Course Elements	Percentage or Points Values
6	Module Quizzes	30%
1	Radiologic Incident PowerPoint Course Project	20%
6	Discussion Participation	20%
1	Comprehensive Final Exam	30%
Letter Grade		Percentage Score
A		89.5+
B		79.5-89.4
C		69.5-79.4
D		64.5-69.4
F		<64.5

Last Day for "W", 4:00 p.m. –October 30, 2023. Drops after this date will receive grades of "F."

### Final Course Grade

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 policies.

## Course Requirements

Students can proceed through the course content at their own pace within the boundaries set by the Course Schedule and the MSU Academic Calendar. See the course calendar in the syllabus and within D2L for specific information about activities and due dates. This course is designed to give adequate time to complete all assignments and quizzes in a timely manner. It is **NOT** recommended that you wait until the last minute to submit an assignment, quiz or discussion board post. Technical problems can occur. If you wait until the last minute and you run into a problem, **DO NOT** send anything to the instructor as an e-mail attachment. It will not be accepted and a grade of zero will be recorded for that activity.

## Course Modules

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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

Supplemental files and activities are available within D2L to reinforce major topics in the reading assignments.

### Module Quizzes (30%)

When a student has reviewed a unit and is ready for the quiz, he/she will log into D2L and receive a customized quiz consisting of random multiple choice questions. See the course calendar in the syllabus and within D2L for due dates. Since the quizzes are timed, it is important to know the unit content before attempting the quizzes. Students will have **30 minutes** to complete the **25 question** quizzes. Quiz scores will be available immediately after a student submits his/her quiz for grading. **No late submissions will be accepted.**

### 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.

### Discussion Board Participation (20%)

You will participate in three discussion boards where you will post a 3 – 4 paragraph post based upon a specific article you will read. For the fourth discussion board you will professionally critique another student's post from one of the first three discussion boards. Please read the course content for complete instructions. In the online instructions you will find what should be included in your posts and the outside research expectations for each post. **All discussions MUST be submitted by the published due date (see the course calendar). Because discussion boards depend upon timely student submissions, no late submissions will be accepted.**

### Comprehensive Final Exam (30%)

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

The final examination must be completed by December 8, 2023, 11:59 pm. Incomplete final exams will be scored a zero and the student will fail the course. If you know you will miss a due date because of extenuating circumstances, you should contact me immediately. Acceptance of an extenuating circumstance is at the my discretion. Since the final examination is open for one month, only the most extraordinary of circumstances will be considered.

The final examination uses the Respondus Lockdown Browser with Webcam. There is a practice test which must be completed before you may take the final examination.

#### EXAM FORMAT

- The proctored comprehensive final examination is closed book and consists of 100 random multiple-choice questions.
- The exam is a timed, 2-hour (120 min) test.
- To prepare for this exam: The final has been derived from the entire content of this course. Review all of your quizzes and your textbook chapters. Reinforcing study materials include the PowerPoint presentations.

#### WHAT TO BRING

- You may bring one sheet of blank scratch paper.
- A non-programmable scientific calculator (TI-30XIIS Scientific Calculator **-or-** TI-30Xa Scientific Calculator recommended).
- No smart watches or any other electronic devices will be allowed.
- You are not allowed to print the final exam.
- No textbooks or notes may be used.

## Attendance

Since this is an online course, there are no mandatory face-to-face sessions. However, the student should be vigilant in logging onto D2L. Regular checks will ensure messages from the instructor are received in a timely manner. See the course calendar below and in D2L for specific information about activities and due dates. The instructor is available to meet face-to-face or by ZOOM with any interested students. Please email the instructor to schedule an appointment.

## Important Dates

All times are MSU campus time

Date	Assignment
August 28	Class opens Review course syllabus
September 11	Module 1 Test due by 11:59 pm Discussion Board 1 closes at 11:59 pm
October 2	Module 2 Test due by 11:59 pm
October 23	Module 3 Test due by 11:59 pm Discussion Board 2 closes at 11:59 pm
October 30	Last day to withdraw with a "W" by 4:00 pm campus time
November 13	Module 4 Test due by 11:59 pm
November 27	Module 5 Test due by 11:59 pm Discussion Board 3 closes at 11:59 pm
December 8	Module 6 Test due by 11:59 pm Discussion Board 4 closes at 11:59 pm
December 13	Radiologic Incident PowerPoint Course Project due by 11:59 pm <b>Final Exam is due by 11:59 pm</b>

**\*All times are CST (Central Standard Time) on the date indicated.**

## Technical Difficulties

On occasion, you may experience problems with accessing D2L, accessing class files located within D2L, connecting with your internet service, or may encounter other computer-related problems. Make the professor aware of a technical problem as soon as possible. If a problem occurs on our end, such as D2L failure, then a due date extension will typically be granted.

**However, keep in mind 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 a reason for the instructor to allow students extra time to submit assignments, tests, or discussion postings.**

Dropbox assignments that can be attached in an email should be emailed to me as soon as a

problem is encountered. Failure to do so may result in points being lost, regardless of connection issues.

For help options:

- For D2L issues go online go to the [Distance Education Helpdesk](#)
- By phone call the Distance Education office at 940-397-4868 between 8am and 5pm.
- Use the D2L help link in D2L.
- Contact me.
- For other computer access issues, go online to the MSU [Information Technology Website](#).

## Instructor Course Policies

**Conduct/Honesty/Honor System:** RADS 3773 adheres to the [MSU Code of Conduct](#).

In particular, academic dishonesty, however small, creates a breach in academic integrity. A student's participation in this course comes with the expectation that his or her work will be completed in full observance of the MSU Code of Student Conduct. A student should consult the current Student Handbook for answers to any questions about the code.

All components of RADS 3773 are designed to represent the efforts of each student individually and are NOT to be shared, copied, or plagiarized from other sources. When students submit their efforts for grading, they are attesting they abided by this rule.

An online plagiarism service may be used in this course. Student assignments may be uploaded to the service for identification of similarities to other student papers and published works.

If you have any questions about what constitutes plagiarism, please consult:

- The [University Academic Dishonesty Policy](#)

## Institutional Information

### Special needs

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Disability Support Services in Room 168 of the Clark Student Center, (940) 397-4140.

### **Administrative process**

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

1. Department Chair – Dr. Beth Vealé (940-397-4611)
2. College Dean - Dr. Jeff Killion (940-397-4679)
3. Dean of Students – [student.affairs@msutexas.edu](mailto:student.affairs@msutexas.edu) (940-397-7500)

### **Smoking/Tobacco Policy**

College policy strictly prohibits the use of tobacco products in any building owned or operated by MSU TEXAS 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 as 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 [Safety / Emergency Procedures](#). 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.”](#)