



MIDWESTERN STATE UNIVERSITY

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

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**RADS 3773 Radiobiology and Protection**

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**Course Information**

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<b>Name</b>	RADS 3773-X20 Radiation Biology and Protection (online)
<b>Credit</b>	3 hours
<b>Term</b>	Spring 2022
<b>Dates</b>	January 10, 2022 – April 26, 2022
<b>Time Commitment</b>	Students should expect to spend at least 9 hours per week on course material (15 week term)
<b>Prerequisites</b>	None

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**Professor**

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**Rodney Fisher, PhD, R.T. (R) (N) (CT) (BD), CNMT**

**Assistant Professor / Radiation Safety Officer**

**E-mail:** [Rodney.Fisher@msutexas.edu](mailto:Rodney.Fisher@msutexas.edu)

**Phone:** (940) 397-4615      **Fax:** (940) 397-4845

**Office:**      Midwestern State University  
                  3410 Taft Blvd, Centennial Hall 430N  
                  Wichita Falls, TX 76309

**Office hours:** Tuesdays, Wednesdays, & Thursdays 1pm – 3pm  
*and by appointment (preferred)*

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**Communicating with the Professor**

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I prefer email so there is a record of the communication and often I am away from my desk. Phone calls may be answered by email when appropriate. I will respond or at least acknowledge all student communications within five (5) business days. If this time period will be longer because I am out of town or for another reason, a news item will be posted online in D2L for the class. Please always give me the time asked for to respond before repeating your request.

## Course Description

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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

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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

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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.

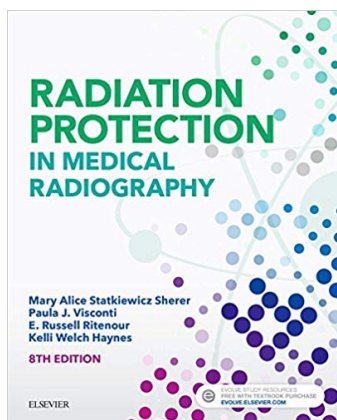
## Course Materials

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### Textbooks

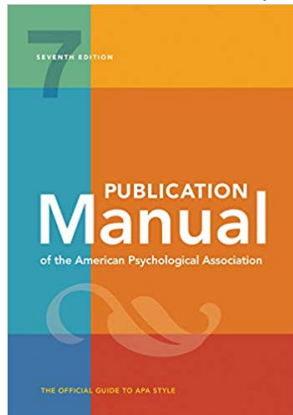
#### Required

Sherer, M.A., Visconti, P.J., Ritenour, E.R., & Haynes, K.W. (2018). *Radiation protection in medical radiography* (8<sup>th</sup> Ed.). St. Louis, MO: Elsevier. [ISBN: 978-0-323-44666-2]



## Required

American Psychological Association. (2020). *Publication manual of the American Psychological Association* (7<sup>th</sup> 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

You need access to an up-to-date computer with an internet connection in this course. D2L does not work well with Internet Explorer. Use a different browser when working in D2L.

## Assignments

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

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| 1. Module Quizzes                                | 30% |
| 2. Radiologic Incident Powerpoint Course Project | 20% |
| 3. Radiologic Incident Discussion Participation  | 20% |
| 4. Comprehensive Final Examination (proctored)   | 30% |

## Important Dates

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All times are MSU campus time

<b>Date</b>	<b>Assignment</b>
<b>January 10</b>	Class opens Review course syllabus
<b>February 1</b>	Module 1 Test due by 11:59 pm Discussion Board 1 closes at 11:59 pm
<b>February 15</b>	Module 2 Test due by 11:59 pm
<b>March 1</b>	Module 3 Test due by 11:59 pm Discussion Board 2 closes at 11:59 pm
<b>March 15</b>	Module 4 Test due by 11:59 pm
<b>March 21</b>	Last day to withdraw with a "W" by 4:00 pm campus time
<b>March 29</b>	Module 5 Test due by 11:59 pm Discussion Board 3 closes at 11:59 pm
<b>April 12</b>	Module 6 Test due by 11:59 pm
<b>April 19</b>	Discussion Board 4 closes at 11:59 pm
<b>April 26</b>	Radiologic Incident PowerPoint Course Project due by 11:59 pm Final Exam is due by 11:59 pm

## 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

## Grading

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### Grade Distribution

- 30% Module Tests
- 20% Radiologic Incident Powerpoint Course Project
- 20% Radiologic Incident Discussion Boards
- 30% Comprehensive Final Exam

### Grade Scale

A=100-90

B=89-80

C=79-70

D=69-60

F=59 and below

### Grading Cycle

All assignments are graded together as a group to maintain a higher level of consistency. Grading begins on the first business day after a due date, outside of university holidays and professional meetings, and is typically completed before the next due date. You may track your progress through the Gradebook in D2L.

### Feedback

Feedback varies throughout the course. The News section of the course is where I will send messages to the entire class. It is best to set up your D2L account to receive an email notification (to the email of your choice) when News items are posted, so you do not miss important updates.

1. Click the down arrow in the News section on the 3773 course home page
2. Select Notifications
3. Check the box next to "News - new item available" and then check any other boxes you wish to receive an email notification from.
4. Check the email address you wish to send email notifications. If you need to change this, select "change your email settings" and enter the new email address. This email address should be an email address you check frequently.

You are welcome to email questions to clarify concepts or look for further explanations. If I come across repeated questions I will provide feedback or supplementary resources in the News section of the course so that everyone can benefit from it. You might look there first, because your question may be located there.

### Late Work

#### Due Dates

Assignments are due on Tuesdays (see Important Course Dates above). Assignments must be submitted by 23:59 (11:59 pm) Central time, on scheduled due dates in the course schedule. If a student fails to meet a deadline the student will receive no credit for the assignment not submitted on time. However, each assignment must be completed in order before the next assignment can be turned in for a grade. This includes work that was late and given a "zero" grade. All course work must be completed in the semester the course is taken. The professor does not give incomplete grades.

### Emergency Extension

If you have a major event such as a death in the family, illness, hospitalization, or other extenuating circumstances, email the professor at [Rodney.Fisher@msutexas.edu](mailto:Rodney.Fisher@msutexas.edu) as soon as possible and on or before the scheduled due date. Extensions are granted on an individual basis. If an extension is granted, typically the following guidelines will be followed.

1. The assignment may be up to one week late and still qualify for full credit. After the one-week extension has passed, ten points per day can be deducted until the assignment is no longer worth any credit.
2. When the assignment is completed, you must send a follow-up email to let the professor know it is ready to grade. Failure to notify the professor could lead to a grade of zero.
3. **Avoid End of Course Late Work:** Please note there are University deadlines for submitting grades at the end of the semester. All work must be turned in at least a week before grades must be posted.
4. If a course includes interaction between students in the discussion board, and if extenuating circumstances will prevent you from participating, an alternate assignment may be considered at the discretion of the professor.

### 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.

### Module Tests (30%):

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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. Each Module Test can only be attempted once and your grade will be immediately posted at the end of the test. For the due dates, please refer to the schedule in D2L and this syllabus. **No late submissions will be accepted.**

### Radiologic Incident PowerPoint Course Project (20%):

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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%):

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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 Examination (30%):**

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

The final examination must be completed by April 26, 2022 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 (see above for recommended calculators).
- 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.

## **Technical Difficulties**

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On occasion, you may experience problems with accessing D2L, accessing class files located within D2L, connecting with your internet service, or you 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 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](#).

## Attendance

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This is an online course and there are no mandatory sessions. However, you should be vigilant in logging in to D2L. You should expect to log in at least 3 times per week. Regular checks will ensure that messages from me are received in a timely manner. This course is on a schedule that will be strictly adhered to. See the Important Dates section above for specific due dates.

## Requesting a Withdrawal

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The last opportunity to drop this course with a grade of "W" is 4:00pm on April 23, 2021. All withdrawals **must be initiated by you**. After this date dropping the course results in a grade of "F".

In an emergency or extenuating circumstance, you may request a grade of "Incomplete" before grades are submitted. If I grant the "Incomplete," you have until thirty (30) days after the beginning of the next long semester to complete the course requirements. If you do not complete the course requirements within the deadline, the grade of "Incomplete" will automatically convert into a grade of "F".

## Special Needs

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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 adjustments in its policies, practices, services, and facilities to ensure equal opportunity for qualified persons with disabilities to participate in all educational programs and activities.

The Office of Disability Services (ODS) provides information and assistance, arranges accommodations, and serves as a liaison for students, professors, and staff. The ODS has assistive devices such as books on tape, recorders, and adaptive software which can be loaned to qualified individuals. A student/employee who seeks accommodations based on disability must register with the Office of Disability Services in the Counseling Center; Clark Student Center Room 108. Documentation of disability from a competent professional is required.

Individuals with grievances related to discrimination or lack of accommodation based on a disability are encouraged to resolve the problem directly with the area involved. If the matter remains unresolved, the Office of Disability Services for resolution will provide advice and/or assistance. The grievance procedure may be found in the Student Handbook and Activities Calendar.

The Director of the Counseling Center serves as the ADA Coordinator and may be contacted at (940)397-4618, TDD (940)397-4515, or 3410 Taft Blvd., Clark Student Center Room 108.



## Administrative Process

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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. Beth Vealé (940-397-4611)
2. College Dean - Dr. Jeff Killion (940-397-4679)
3. Dean of Students – Matthew Park (940-397-7500)

## Honor System

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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.

Cheating includes, but is not limited to

- Use of any unauthorized assistance in taking quizzes, tests, or examinations;
- Dependence upon the aid of sources beyond those authorized by the professor in writing papers, preparing reports, solving problems, or completing other assignments; or
- The acquisition of tests or other academic materials belonging to the university faculty or staff without permission.

Plagiarism includes, but is not limited to

- The use of, by paraphrase or direct quotation without correct citation in the text and in the reference list,
- The published or unpublished works of another person.
- Students may NOT submit papers and assignments that they have previously submitted for this or other courses.
- The use of materials generated by agencies engaged in "selling" term papers is also plagiarism.
- Collaboration between students on individual projects

Academic dishonesty (cheating, plagiarism, etc.) will not be tolerated in this class. Whenever a student is unsure of whether a particular situation will be interpreted as academic dishonesty, he/she should ask the professor for clarification. If students are guilty of academic dishonesty, a grade of zero (0) will be given for the quiz, assignment, etc. Based upon the severity of the case, a grade of "F" may be given. Cases will be referred to the department disciplinary committee which may result in dismissal from the program. Cases may also be referred to the Dean of Students for possible dismissal from the university.

Students are encouraged to review the tutorials and suggested websites for more information about plagiarism. If you have any questions about what constitutes plagiarism, please consult:

- The [University Academic Dishonesty Policy](#)

- The website [Plagiarism.Org](http://Plagiarism.Org), or
- The professor

**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.

**Senate Bill 11**

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Senate Bill 11 Senate Bill 11 passed by the 84th Texas Legislature allows licensed handgun holders to carry concealed handguns on campus, effective August 1, 2016. Areas excluded from concealed carry are appropriately marked, in accordance with state law. For more information regarding campus carry, please refer to the [University's campus carry webpage](#). If you have questions or concerns, please contact MSU Chief of Police [Patrick Coggins](#) by email at [mpatrick.coggins@mwsu.edu](mailto:mpatrick.coggins@mwsu.edu).