



MIDWESTERN STATE UNIVERSITY

Gunn College of Health Sciences and Human Services
Department of Radiologic Sciences
Bachelor of Science, Radiologic Sciences Program
Course Syllabus - Rodney Fisher

RADS 3773 Radiobiology and Protection

Course Information

Name	RADS 3773-X20 Radiation Biology and Protection (online)
Credit	3 hours
Term	Spring 2019
Dates	January 12, 2019 – April 30, 2019
Time Commitment	Students should expect to spend at least 9 hours per week on course material (15 week term)
Prerequisites	None

Professor

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

Assistant Professor, Radiologic Sciences

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

Office: Midwestern State University
 3410 Taft Blvd, Bridwell Hall 230
 Wichita Falls, TX 76309

Office hours: Mondays & Wednesdays 10am – 12pm
 Tuesdays & Thursday 1pm – 4pm
 and by appointment (preferred)

Communicating with the Professor

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

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.

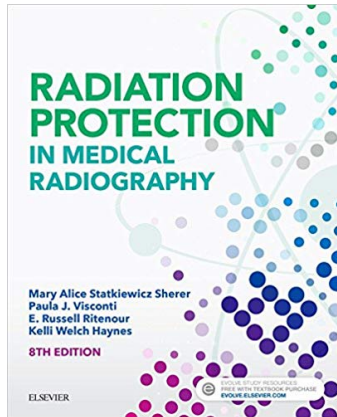
Teaching Methodology

Strategies include directed readings with multiple choice tests, related discussion boards, and an independent research project

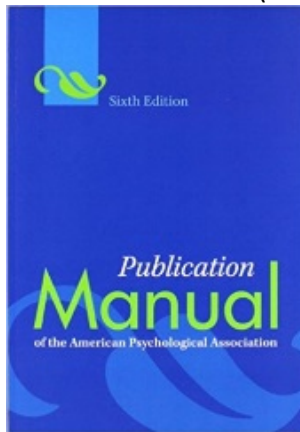
Course Materials

Textbooks**Required**

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

**Required**

American Psychological Association. (2010). *Publication manual of the American Psychological Association* (6th Ed.). Washington, DC: Author. [ISBN 9781433805615]





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

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

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|--|-----|
| 1. Unit Quizzes | 30% |
| 2. Annotated Bibliography | 20% |
| 3. Discussion Participation | 20% |
| 4. Comprehensive Final Examination (proctored) | 30% |

Important Dates

All times are MSU campus time

Date	Assignment
January 12	Class opens Review course syllabus
January 22	Unit Exam 1 due by 11:59 pm Discussion Board 1 closes at 11:59 pm (Original post is due 72 hours before the board closes)
February 19	Unit Exam 2 due by 11:59 pm Discussion Board 2 closes at 11:59 pm (Original post is due 72 hours before the board closes)
March 5	Unit Exam 3 due by 11:59 pm Discussion Board 3 closes at 11:59 pm (Original post is due 72 hours before the board closes)
March 26	Unit Exam 4 due by 11:59 pm Discussion Board 4 closes at 11:59 pm (Original post is due 72 hours before the board closes)
April 9	Unit Exam 5 due by 11:59 pm Discussion Board 5 closes at 11:59 pm (Original post is due 72 hours before the board closes) Annotated Bibliography due by 11:59 pm
April 23	Unit Exam 6 due by 11:59 pm Discussion Board 6 closes at 11:59 pm (Original post is due 72 hours before the board closes)
April 30	Final Exam is due by 11:59 pm (Proctored using ProctorU)

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

Evaluation

Grade Distribution

- 30% Unit Quizzes
- 20% Annotated Bibliography
- 20% Discussion Participation
- 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 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.

Technical Difficulties

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 the professor 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 your professor.
- For other computer access issues, go online to the MSU [Information Technology Website](#).

Attendance

This is an online course and there are no mandatory sessions. However, the student should be vigilant in logging in to D2L. The student should expect to log in at least 3 times per week. Regular checks will ensure that messages from the professor 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

The last opportunity to drop this course with a grade of “W” is 4:00pm on March 25, 2019. All withdrawals **must be initiated by the student**. After this date dropping the course results in a grade of “F”.

In an emergency or extenuating circumstance, a student may request a grade of “Incomplete” before grades are submitted. If the professor grants the “Incomplete,” the student has until thirty (30) days after the beginning of the next long semester to complete the course requirements. If the student does not complete the course requirements within the deadline, the grade of “Incomplete” will automatically convert into a grade of “F”.

Special Needs

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

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 sequence:

1. Interim Department Chair – Debra Wynne (940-397-4575)
2. Interim College Dean - Dr. Jeff Killion (940-397-4594)
3. Dean of Students – Matthew Park (940-397-7500)

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.

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.

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. 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](#), 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 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.

Radiobiology and Radiation Protection Assignment Details

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

1. Unit Quizzes	30%
2. Annotated Bibliography	20%
3. Discussion Participation	20%
4. Comprehensive Final Examination (proctored)	30%

Unit 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.**

Annotated Bibliography (20%):

An annotated bibliography is a list of citations for books, articles, and documents. Each citation is followed by a brief (usually 150 words) descriptive and evaluative paragraph known as the annotation. The purpose of the annotation is to inform the reader of the relevance, accuracy, and quality of the sources cited. Creating an annotated bibliography calls for the application of a variety of intellectual skills: concise exposition, succinct analysis, and informed library research. First, locate and record citations for **three (3) peer-reviewed articles in scholarly academic journals** that contain information relevant to this course (ionizing radiation, biological effects, etc.). All three articles should have a common theme. **These three articles must be published within the last five years.** Cite the article using the proper **APA** format. **Note: An APA formatted title page must be included with this assignment.**

Write a concise annotation that summarizes the central theme and scope of the article. You must also discuss **one** of the following for each annotation:

- Evaluate the authority or background of the author.

- Comment on the intended audience.
- Compare or contrast this work with another you cited.
- Explain how this work illuminates your bibliography topic.

More information, the rubric, resources, and the due date are available within D2L under “Course Resources” and “Annotated Bibliography.” This assignment is due on the date listed in the course calendar. **All submissions are considered complete and will be graded as such. Late assignments will not be accepted and a grade of zero (0) will be recorded.**

Discussion Board Participation (20%):

There is a discussion topic for each unit. Students must post **one (1)** original post in response to **EACH** unit discussion question. **Please note the deadline for submitting your response is different from the date the forum closes. Check the schedule at the end of the syllabus for dates.** Each student will be responsible for replying to questions/comments made to his/her original post. Students must also respond to at least **two (2)** postings from other students for each unit. **Student must also monitor the two or more response to other posts. If someone asks or comments on something to which you posted on another student's discussion, you should be courteous enough to answer that person.** This is continued facilitation of a discussion and it is on the rubric. Spelling, grammar, and substance really do count. Try not to veer off subject, and be respectful and considerate of your fellow students' submissions. Students must post responses by the deadlines to receive credit.

What is a discussion-type question? A discussion-type question is one that does not necessarily have a right or wrong answer, unlike a factual question. It facilitates the exchange of knowledge and thought. On the other hand, if asked for the sum of $2 + 2$, the answer is four. This is a fact and there is no room for discussion. There is a right answer and an unlimited number of wrong answers.

What is a meaningful response? A meaningful response is one that contributes to or, in some way, sheds new light on the discussion. “I agree with the others...” is an example of a meaningless response. The forums are designed to encourage interaction between students. Have fun with this activity but take it seriously because it does contribute to your course grade. Remember that your original posting will account for a significant portion (50%) of the course discussion grade for each Unit Discussion and it must be posted before you can participate in the topic discussion. The remainder of the discussion grade will be based upon three (3) things: replying to any questions/comments from classmates regarding your post, responding to original posts of your classmates, and mechanics (grammar, spelling, punctuation, etc.).

All Unit 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%):

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

The final examination must be completed by April 30, 2019 11:59 pm. Incomplete final exams will be scored a

zero and the student will fail the course. Students who know they will miss a due date because of extenuating circumstances should contact the professor so their situations can be dealt with on an individual basis. Acceptance of an extenuating circumstance is at the discretion of the professor. Since the final examination is open for one month, only the most extraordinary of circumstances will be considered.

All students are required to have a webcam and microphone for the Final Exam. The appointment with ProctorU must be scheduled by April 1, 2019 in order to avoid late fees and ensure you get the appointment time you want.

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.
- The final exam will be administered using Desire2Learn (D2L) and ProctorU online proctoring service.
- 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

- The student may bring scratch paper with only ProctorU's phone number on it.
- A non-programmable scientific calculator (see above for recommended calculators).
- No smart watches or any other electronic devices will be allowed.
- Students are not allowed to print the final exam.
- No textbooks or notes may be used.

ProctorU Scheduling

- You may schedule your exam for any time within the testing dates in the course schedule. You must have ALL of your course work complete when you take your final or the final will not be accessible in D2L.
- For ProctorU instructions, please read the ProctorU Student Instruction Guide in the course and visit the [MSU ProctorU Webpage](#).
- Be aware certain equipment is required. Review the ProctorU instructions as soon as possible.
- Contact a ProctorU representative to check your equipment and bandwidth real time before your test date. If anything changes after this check (new computer, updates, ISP changes, etc.), REPEAT the check.
- All appointments should be made at least three days in advance. To make an appointment, simply create an account by visiting the [MSU ProctorU Webpage](#). Once logged in, click on the new exam link and select the exam, date, and time you desire. You must submit payment (based on the length of the exam) at that time - usually about \$30.00. You will receive an email confirming your reservation at the email address you provided to ProctorU.
- Late registrations and *Take it Now* features are subject to availability. Note: If a proctor is not available because you did not schedule your exam in advance, the final is considered missed and a grade of zero will be given.
- Be mindful when you schedule your final exam. If you schedule the exam outside of the 5-day work week (M-F), there may be no one at MSU available to help if you have technical problems.

Technical Problems

- If you are disconnected during your exam, you must immediately send an email to your professor, and immediately contact ProctorU by phone. All exams are monitored and a log is created by the proctor and by D2L.
- *All times will be documented*
- The exam must be taken within the scheduled test dates, regardless of any technical issues that may arise. This is the student's responsibility.
- Late submissions will not be accepted.
- My suggestion is to take the exam during the first days it is available (listed below) to avoid receiving a zero due to technical issues. If you have to reschedule, it must be within the scheduled dates and times.
- See the [Technical Difficulties](#) section above for help options.

All course requirements must be completed before a grade is awarded. Students must complete the final and all course work by the dates published in the course schedule (below).

Note: All assignments received are considered complete and will be graded as such. Any decision of the professor is final and there will be no further changes made.

Scroll down to view the Course Schedule.

Course Schedule

All times are MSU campus time

Date	Assignment
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