



*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. (2022). Radiation protection in medical radiography (9th 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 | Unit Quizzes | 30% |
| 1 | Annotated Bibliography | 20% |
| 6 | Discussion Participation | 15% |
| 1 | Comprehensive Final Exam | 35% |
| 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 24, 2022. Drops after this date will receive grades of "F."

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.

Independent Reading Assignment

Unit 1: Chapters 1, 2, and 3

Unit 2: Chapters 4 and 5

Unit 3: Chapters 6 and 7

Unit 4: Chapters 8 and 9

Unit 5: Chapters 10, 11, and 14

Unit 6: Chapters 12 and 13

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

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 (15%)

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). No late submissions.

Comprehensive Final Exam (35%)

The final examination is a proctored, comprehensive examination consisting of multiple-choice questions. The final exam is a timed, 120-minute test containing 100 questions that will be administered within D2L via Respondus Lockdown. **The final is a closed book examination. You will be allowed to use a calculator (scientific is preferred) and one blank sheet of paper.** Students must complete the final (and all course work) by the dates published in the course calendar within D2L. **Please note:** Any smart device including smart watches will not be allowed during the final exam.

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 insure 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.

Semester Course Calendar

| | |
|-----------|--|
| August 22 | First day of class, Review course syllabus Unit 1-6 Quizzes open at 7:00 AM |
| August 26 | Unit 1 original posts due at 11:59 pm |
| Sep 9 | Unit 1 Discussion Board extra postings and responses due at 11:59 PM Unit 2 original posts due at 11:59 pm |
| Sep 23 | Unit 2 Discussion Board extra postings and responses due at 11:59 PM Unit 3 original posts due at 11:59 pm |
| Oct 7 | Unit 3 Discussion Board extra postings and responses due at 11:59 PM Unit 4 original posts due at 11:59 pm |
| Oct 21 | Unit 4 Discussion Board extra postings and responses due at 11:59 PM Unit 5 original posts due at 11:59 pm |
| Nov 4 | Unit 5 Discussion Board extra postings and responses due at 11:59 PM Unit 6 original posts due at 11:59 pm |
| Nov 18 | Unit 6 Discussion Board extra postings and responses due at 11:59 PM Annotated Bibliography assignment due by 11:59 PM |
| Nov 21 | All quizzes must be completed by 11:59 PM |
| Nov 28 | Final Exam Opens at 7:00 AM. |
| Dec 2 | Final Exam Closes at 3:00 PM** Note the time. See note below. |

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

Instructor Course Policies

Conduct/Honesty/Honor System: In particular, academic dishonesty, however small, creates a breach in academic integrity. A student's participation in this course comes with the expectation that their work will be completed in full observance of the MSU code of Student Conduct and Clinical Policies and Procedures as stated in Clinical Handbook.

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 (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.](#)"