



Midwestern State University

Robert D. & Carol Gunn College of Health Sciences & Human Services
Department of Radiologic Sciences

Revised January 2023

Course Number: RADS 3033

3 credits

Spring 2023

Course Title: Image Acquisition & Processing

Faculty: **Jessyca Wagner, Ph.D., RT(R), CIIP (She/Her/Hers)**

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Course Overview:

This course will analyze radiographic image qualities and the effects of exposure variables on these qualities. The course will also study radiographic imaging technique formulation, image quality assurance, and the synthesis of all variables in image production.

Course Objectives:

Upon completion of this course, the students will:

- Define, recognize, and evaluate the qualities of the radiographic image
- Analyze the effects of exposure variables on each image quality
- Formulate techniques to optimize image quality, minimize patient exposure, and preserve equipment
- Apply methods of image quality assurance
- Adapt technical variables to changing conditions

Course Resources:

Carter, C. E., & Vealé, B. L. (2019). *Digital radiography and PACS* (3rd ed.). Elsevier Mosby.

Johnston, J. N., & Fauber, T. L. (2020). *Essentials of radiographic physics and imaging* (3rd ed.). Elsevier.

Rad Tech Boot Camp Subscription

Class Meeting Date and Time:

Lecture:

Monday 10:00 AM – 11:50 AM, CE 340

Labs:

Monday 1:00 PM – 2:50 PM

Tuesday 9:30 AM – 11:20 AM

Wednesday 1:00 PM – 2:50 PM

Friday 1:00 PM – 2:50 PM

Please note: Students are only required to register for ONE lab period and the lecture, and all labs are held in CE 240 (the radiology lab).

Attendance Policy:

The student has a responsibility to attend all classes/labs at the designated time. If a student does not, they may be classified as tardy or absent. The following criteria of those classifications are solely those of the instructor of this class. Attendance counts as 5% of your overall course grade.

Tardiness

Any student that arrives at class/lab after the starting time designated in the university catalog of classes will be tardy. If a student arrives tardy, two (2) points will be deducted from their attendance grade for each tardy. Three tardies constitute 1 unexcused absence, resulting in five (5) points being deducted from the student's attendance grade.

Absent from Class

A student will be considered absent from class/lab if the student does not show up after fifteen (15) minutes have expired. If the student has an *unexcused* absence, five (5) points will be deducted from their attendance grade. Three (3) separate *unexcused* absences in lecture or lab **will** result in failure of the course and possible dismissal from the program. **There will be no exception to this policy.**

A student will be considered as having an excused absence from class/lab if the following criteria have been established:

1. **Death of an immediate family member.** An immediate family member is considered a grandparent, parent, sibling, spouse, in-law, aunt, uncle, or child.
2. **Summons to appear in court or jury duty.** A copy of the summons is required.
3. **Call to military service.** A copy of your orders to report is required.
4. **University-sponsored event.** Members of athletic teams, college bowl participants, etc. will be excused with proper notification.
5. **Debilitating illness or disability.** Will be addressed on an individual basis.

If a student is affected by an illness that is not debilitating (i.e., COVID, flu, viral infection) which may cause the student to miss more than one consecutive class/lab session, that student will be marked as unexcused for the number of days missed **unless a doctor's note is provided**. A doctor's note **must** have a statement to the effect that you were seen in the office or you are cleared to return to classes. It **does not** have to state what you were seen for. **There will be no exception to this policy.** If a student is affected by an illness that is not debilitating but only needs to miss one class/lab session, a doctor's note is not required; however, contact with the instructor must be made **BEFORE** the designated class time to be considered excused.

Personal Appointments

Students should refrain from making appointments that will take them out of class/lab. Routine doctor or dentist visits are an example of this. If you leave class/lab early because of an appointment or for any other reason, the occurrence will be treated with the same regard as tardiness. Doctor visits will be approved only with an accompanying release note.

Classroom Behavior:

You must respect the right of every student in the classroom to learn. Talking during class, leaving or entering the room repeatedly during class, or any other type of disruptive behavior will not be tolerated and may result in your being asked to leave the classroom. If this should occur, you will not be allowed to return to class that day, and it will be treated as an unexcused absence with a 5-point deduction from your attendance grade. Repeat offenders will be sent directly to the program chair's office. **Cell phones are not to be used in class.** Disruptions because of these devices may result in your dismissal from class and/or the program.

Pronouns

Names and pronouns are deeply personal. Assumptions about them can cause harm. In this class, we will respectfully use whatever names and pronouns peers, authors, and community members ask us to use. If we make a mistake, we will respectfully correct ourselves. Please let me know if you have a chosen name different from that on your academic record or particular pronouns you prefer. To learn more about personal pronouns and why they are important, please visit MSU Texas' [Guide to Pronouns](#) and [pronouns.org](#).

Mental Health

We all experience stressful and difficult events as a normal part of life. As your instructor, I believe your mental health is an important part of your academic success. Success in this course depends heavily on your personal health and well-being. You should recognize that stress is an expected part of the college experience, and it often can be compounded by unexpected setbacks or life changes outside the classroom. I

strongly encourage you to reframe challenges as unavoidable pathways to success. Reflect on your role in taking care of yourself throughout the term before the demands of exams and projects reach their peak. Please feel free to reach out to me about any difficulty you may be having that may affect your performance in this course as soon as it occurs and before it becomes unmanageable. In addition to your academic advisor and me, I strongly encourage you to contact the many other support services on campus that stand ready to assist you.

- Counseling Center – call 940-397-4618 to schedule an appointment
- [BetterMynd](#)- free virtual counseling for students looking for evening appointments
- A list of self-help [apps](#)
- More online [resources](#)
- More [mental health resources](#)

Course Modules:

Module 1 (Approximately 4 weeks)

- Chapters 8, 9, 11, 12, & 13 – Johnston
- Rad Tech Boot Camp Courses:
 - X-Ray Production (review from Physics) – all lessons
 - X-Ray Interactions with Matter – all lessons
 - X-Ray Beam – all lessons
 - Image Quality Factors – Magnification & Distortion ONLY
 - Primary Exposure Factors – all lessons
 - Advanced Exposure Factors – all lessons
 - Radiography Math Fundamentals – all lessons

Module 2 (Approximately 4 weeks)

- Chapters 2, 3, 4, 5, & 6 – Carter
- Rad Tech Boot Camp Courses:
 - Radiation Units of Measurement (review from Physics) – all lessons
 - Fundamentals of Digital Radiography – all lessons
 - Image Quality Factors – all lessons except magnification & distortion

Module 3 (Approximately 3 weeks)

- Chapters 7, 8, 9, 10, 11, 12, & 13 – Carter
- Rad Tech Boot Camp Courses:
 - Image Evaluation – all lessons
 - Quality Control – all lessons

Lecture:**Weekly Quizzes / Module Exams / Final Exam**

All lecture content will be covered in class and lab, and materials will be posted online in D2L. Every lecture period, you will have a quiz on the content covered the previous week. It will be five (5) short-answer questions. The quizzes will be given during the first 10 minutes of class, and then the lecture will follow. The grades on these quizzes will make up 15% of your overall course grade.

You will also be required to complete videos and quizzes in Rad Tech Boot Camp for each module. Your scores from those assessments will make up 10% of your total course grade.

There will be three (3) module exams throughout the semester. These module exams will have 50 multiple-choice, short-answer, and fill-in-the-blank questions and will count for 30% of your overall course grade. They will be completed online using the Respondus Lockdown Browser with Webcam in D2L. You will not be required to come to the classroom on exam days.

The final exam will be comprehensive of the entire semester and will have 100 multiple-choice, short-answer, and fill-in-the-blank questions. None of the questions will be from previous exams. A final review period has been factored into the course schedule, but remember, the course schedule is tentative, so a final review is not guaranteed. The final will count for 20% of your overall course grade and will be administered online using the Respondus Lockdown Browser with Webcam in D2L.

Research Poster

You will form small groups (three (3) maximum) within the class, or you may work by yourself, to create a radiology-related virtual research poster that you will submit to the Texas Society of Radiologic Technologists (TXSRT) Annual Meeting competition. It is for a grade, and you must follow all course and TXSRT guidelines to receive full credit. Details about the poster are provided in D2L and will be elaborated on in class. Deadlines for submission will be posted in D2L once they are announced by TXSRT. The poster will count for 10% of your overall course grade.

Laboratory:

The laboratory portion of this course offers you the opportunity to test and practice the theories and facts discussed in lecture. Teamwork is an essential element in the healthcare industry. When in the labs, you must work within the group and **NOT** as an individual. The laboratory portion of this course will count for 10% of your overall course grade and will be comprised of the technique chart project and escape room lab final.

At the beginning of the semester, you will be put into groups within your lab period. You will work together to create a technique chart for your assigned room throughout the semester. You will be permitted time during lab to work on this, but will have no time outside of class to work, so you must use your time wisely. It would be wise to incorporate what you're doing in positioning with this project to double your class time. Examples and more detailed instructions will be provided in class. **This project will be due the last week of class on your scheduled lab day.**

There is a lab "final" in this course this semester, which is the Escape Room assignment. More information will be given closer to time. The lab final will be held the last week of classes (the week before lecture finals).

Grading:

Attendance	5%
RTBC	10%
Poster	10%
Lab	10%
Weekly Quizzes	15%
Unit Exams	30%
Final	20%

Scale:

100 - 90	= A
89 - 80	= B
79 - 75	= C
74 - 69	= D
68 - below	= F

NOTE: You must make a C average (75%) or above to continue in the Radiologic Technology Program.

The last opportunity to drop this course with a "W" is 4:00 PM March 27, 2023.

Please refer to the Undergraduate Bulletin for details about receiving a grade of "Incomplete" in a course. In an emergency or extenuating circumstance, a student may request a grade of "Incomplete" in a course before grades are submitted.

If the instructor 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."

Any student desiring one (1) extra credit point added to their final course grade may email a shark picture to the professor with the subject line "Extra Credit" by September 1. No other extra credit opportunities will be offered in this course.

Disability Support Services:

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 Support Services (DSS) provides information and assistance, arranges accommodations, and serves as a liaison for students, instructors, and staff. The DSS has assistance devices such as books on tape, recorders, and adaptive software which can be loaned to qualified individuals. A student/employee who seeks accommodations on the basis of disability must register with the Office of Disability Support Services in the Clark Student Center Room 168 or call 940-397-4140 for more information. Documentation of disability from a competent professional is required.

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

The ADA Coordinator may be contacted at (940) 397.4140, or 3410 Taft Blvd., Clark Student Center Room 168.

Conduct/Honesty/Honor System:

RADS 3033 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/her work will be completed in full observance of the MSU Code of Student Conduct. A student should consult the Student Handbook for answers to any questions about the code.

Students are encouraged to take full advantage of many resources available, including Internet sites, handouts, other textbooks & journals, faculty, and peers. This interactive collegial learning environment is conducive to life-long learning.

Specific components of RADS 3033 are designed to represent the efforts of each student individually and are NOT to be shared. Submitting someone else's work as your own or improperly cited work constitutes plagiarism. Please see the Midwestern State

University Catalog for further discussion of plagiarism. Plagiarism will result in an F for the assignment, and possibly the course. The student will also be referred to administration for further action. When students submit their efforts for grading, they are attesting they abided by this rule. ***Quizzes and exams are not to be copied in any form or shared in any form. Students caught engaging in such activity will receive an F for the course and be referred to University administration for dismissal.***

Cheating includes, but is not limited to: (1) use of any unauthorized assistance in taking quizzes, tests, or examinations; (2) dependence upon the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or completing other assignments; or (3) 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 on 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. Students are encouraged to review the tutorials and suggested websites for more information about plagiarism.

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 product in order to verify originality and authenticity, and for educational purposes.

Campus Carry Policy:

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 get in touch with MSU Interim Chief of Police [Steven Callarman](#) by email at steven.callarman@msutexas.edu.

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."](#)

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) 397.4594
3. Dean of Students: Matthew Park (940) 397.7500

Tentative Course Schedule

Date:	Assignments
January 16	Intro/Syllabus Lecture: Chapter 8 – Johnston (through page 89 only) **Please note – this is a school holiday. The material will be covered during lab periods.**
January 23	Quiz: Chapter 8 – Johnston Lecture: Chapter 9 – Johnston
January 30	Quiz: Chapter 9 - Johnston Lecture: Chapters 11 & 13 – Johnston Poster Topic, Title, & Group Members due 11:59 PM CST
February 6	Quiz: Chapters 11 & 13 - Johnston Lecture: Chapter 12 – Johnston **Please note – this is ACERT week. There will be NO labs this week.**
February 13	Module 1 Exam (Online) RTBC videos and assessments due 11:59 PM CST
February 20	Lecture: Chapters 2 & 3 – Carter
February 27	Quiz: Chapters 2 & 3 – Carter Lecture: Chapter 4 – Carter Poster Application Submission due 11:59 PM CST
March 6	Quiz: Chapter 4 – Carter Lecture: Chapter 5 – Carter
March 13	Spring Break
March 20	Quiz: Chapter 5 – Carter Lecture: Chapter 6 – Carter
March 27	Module 2 Exam (Online) RTBC videos and assessments due 11:59 PM CST
April 3	Lecture: Chapters 7 & 8 – Carter Easter Break begins at 10 PM on April 5 Friday lab students must come to lab earlier in the week
April 10	Quiz: Chapters 7 & 8 – Carter Lecture: Chapters 9, 10, & 11 – Carter
April 17	Quiz: Chapters 9, 10, & 11 – Carter Lecture: Chapters 12 & 13 – Carter TXSRT Conference at MSU April 20-22
April 24	Module 3 Exam (Face-to-Face) RTBC videos and assessments due 11:59 PM CST
May 1	Final Review (if possible) Lab Escape Room “Final” Technique Chart Due 11:59 PM CST
May 10	Lecture Final (Online) Wednesday, May 10 at 10:30 AM