MIDWESTERN STATE UNIVERSITY
ROBERT D. & CAROL GUNN COLLEGE OF HEALTH SCIENCES & HUMAN SERVICES

Bachelor of Science in Radiologic Technology

1/21

Course Number: **RADS 3063** **3 Credits**

Course Title: **Radiographic Procedures III**

Prerequisites: RADS 3043

Faculty:

Debra R. Wynne, MSRS, RT(R)
She/Her
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Course Overview:
This course focuses on advanced radiographic procedures and image evaluation involving fluoroscopy, surgery, mobile, and trauma.

Course Objectives: Upon completion of this course, a student will be able to:

- master the manipulation of the equipment
- master the positioning and alignment of anatomical structures & equipment
- evaluate images for proper demonstration of advanced anatomy & related pathology

Textbooks:

REQUIRED

Bontrager, K. & Lampignano, J. (2018). *Textbook of Radiographic Positioning and Related Anatomy.* (9th ed.). St. Louis, MO: Elsevier. [ISBN 978-0-323-39966-1]

Ehrlich, R.A. & Coakes, D.M.(2021). *Patient Care in Radiography* (10th ed). St. Louis, MO: Elsevier. [ISBN 978-0-323-65440-1]

Johnston, J.N. & Fauber, T.L. (2016). *Essentials of Radiographic Physics and Imaging.* (2nd ed.). St. Louis, MO: Elsevier. [ISBN 9780323339667]

Methodology / Teaching Strategies:

Independent reading assignments, written assignments, Internet searches, quizzes, classroom discussion, and presentations are used in this course.

All assignments must be written at the baccalaureate level and will be graded for accuracy, completeness, quality, spelling, grammar, and integrity.

Grading / Evaluation:

Participation	5%
Weekly Quizzes	15%
Exams	40%
Group Presentation	10%
Comprehensive Closed Book Final	30%

A	89.5 – 100
B	79.5 - 89.45
C	74.5 – 79.45
D	69.5 – 74.45
F	Below 69.45

The last opportunity to drop this course with a grade of 'W' is 4:00pm April 23, 2021. 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.'

Attendance:

Attendance is mandatory. Excessive absences will result in a referral to the Dean of the College of Health Sciences, and may result in your being dropped from the Program. Excessive absences are defined as: Three (3) absences from lecture (exceptions: medical reasons – physician note required). **Missed quizzes may only be made up if prior arrangements are made.** If a student is more than 10 mins late to class it will count as a tardy. Three (3) tardies will count as an absence.

This course uses TopHat software during class. Attendance will be taken using TopHat. All students are required to purchase the TopHat app.

CLASS ACTIVITIES AND ASSIGNMENTS

Participation- 5%

Students must participate in class activities, projects, and discussions. Evidence of class participation includes: coming to class, being on time to class, participating in class discussions and submitting the assignments in a timely manner. Each absence (see attendance) will be a 10 point deduction in the Participation area.

Weekly Quizzes – 15%

Each week a quiz will be given at the beginning of class time. Students will not be allowed to make up quizzes missed. Each quiz will consist of 5-10 fill-in-the-blank/short answer type questions.

Exams - 40%

Module 1: Image Intensified Fluoroscopy & Contrast Media
Module 2: Biliary System, Upper GI System, & Lower GI System
Module 3: Urinary System & Special Radiographic Procedures
Module 4: Trauma, Mobile, & Surgical Radiography; Pediatrics & Geriatrics
Module 5: Angiography & Interventional Radiology

You will be required to use Scantron answer sheets for all exams.

CV & IR Assignment – 10%

The purpose of this activity is to reinforce the **role of advanced medical imaging procedures**. Students should demonstrate that they have an understanding of the procedures they are given, but perhaps more importantly, this presentation provides an opportunity for students to see how the procedures done every day in medical imaging departments is a vital component for successful diagnosis and treatment of patients. The intended audience for the student-created presentation is the patient.

Students will prepare a presentation on a given procedure.

Topic:
Students will be divided into groups of 5 students. The instructor will present the group a piece of equipment used in advanced procedures in radiology. The students will research sources to find out what type of equipment the group has been given. The students will explore which procedure the equipment is used for and answer the following questions in terms a patient would understand.

Each student in the group will work on a different set of questions. A short (10-15 minute presentation) will be given by the group to the class with each of the students presenting their set of questions relating to the equipment and procedure.

Complete instructions can be found on D2L

Comprehensive Closed Book Final Exam - 30%

The final examination is a **"closed book",** comprehensive examination of a 100 question multiple-choice, short answer, and fill-in-the-blank format. All final examinations will be administered during the designated date(s) and time(s) listed in the calendar and/or syllabus. There will be NO alteration of any type to this schedule.

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, instructors, 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 on the basis of disability must register with the Office of Disability Services in the Counseling Center, Clark Student Center Room 168 or call (940) 397-4140, https://mwsu.edu/student-life/disability/ . 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 3063 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 and journals, faculty, and peers. This interactive collegial learning environment is conducive to life-long learning.

Specific components of RADS 3063 are designed to represent the efforts of each student individually and are NOT to be shared. These components include the written assignments submitted for a grade. 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.

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 recognition, the published or unpublished works of another person. The use of materials generated by agencies engaged in "selling" term papers is also 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. Specifically, faculty may submit student papers and assignments to an external agency to detect plagiarism.

Academic dishonesty (cheating, plagiarism, etc.) will not be tolerated in this class. If a student is found to have committed 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.

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:

- Department Chair – Dr. Beth Vealé (940-397-4611)
- College Dean – Dr. Jeff Killion (940-397-4594)
- Dean of Students – Matthew Park (940-397-7500)

Tentative Spring 2021 COURSE SCHEDULE

Dates	Activity
Jan 12	Course Intro, Module 1; Weekly Quiz 1
Jan 19	Module 1 cont'd; Weekly Quiz 2
Jan 26	**TEST Module 1**
Feb 2	Module 2; Weekly Quiz 3
Feb 9	Module 2; Weekly Quiz 4
Feb 16	**TEST Module 2**
Feb 23	Module 3; Weekly Quiz 6
Mar 2	**TEST Module 3**
Mar 9	Module 4; Weekly Quiz 8
Mar 16	Module 4 cont'd; Weekly Quiz 9
Mar 23	Module 4 cont'd; Weekly Quiz 10
Mar 30	**TEST Module 4**
Apr 6	Module 5 (Presentations)
Apr 13	Module 5 (Presentations)

Apr 20	**TEST Module 5**
Apr 27	**FINAL EXAM (Tuesday 9am)**

Reading for Advanced Radiographic Procedures

Authors	Chp	Content	Pages
Module I		**Fluoroscopy & Contrast Media**	
Johnston & Fauber	14	Image Intensified Fluoroscopy	205 - 218
Ehrlich & Coakes	19	Contrast Media	351 - 362
Bontrager	12, 14	(A few pages in two different chapters)	461 – 462; 538 - 542
Objectives			

1. Describe advantages of image intensified fluoroscopy over conventional screen fluoroscopy
2. Describe the principal parts of an image intensifier and their function
3. Explain basic function and operation of an automatic brightness control (ABC)
4. Evaluate options for fluoroscopic viewing systems and the advantages and disadvantages of each
5. Describe the options for recording systems and the advantages and disadvantages of each
6. Explain digital fluoroscopic image acquisition
7. Discuss various methods of reducing dose to patient, radiographer, and radiologist during a fluoroscopic examination
8. Identify the major areas of quality control pertaining to fluoroscopy
9. Differentiate between those quality control processes that are the responsibility of the radiographer and those of the medical physicist
10. State the purpose of contrast media
11. Compare negative and positive contrast agents
12. Name the general types of contrast media used for specific radiographic procedures
13. Explain the importance of osmosis as it relates to various effects of iodinated ionic contrast media
14. Discuss the advantages of nonionic iodinated contrast media
15. Differentiate among the major adverse effects of various contrast agents
16. Recognize clinical symptoms of adverse reactions to iodinated contrast media to the level of treatment required
17. Relate the patient history to the possibility of adverse reactions
18. Explain the patient education and assessment required prior to IV contrast administration

Authors	Chp	Content	Pages
Module II		**Digestive System**	
Ehrlich & Coakes	18	Preparation & examination of the GI tract	326 - 349
Bontrager	12	Biliary Tract & Upper GI System	446 - 486
Bontrager	13	Lower GI System	487-524
Objectives			

1. Identify and describe the radiographic exams and common pathologies for the following exams:
    a. Esophagram (single, double, water soluble)
    b. Upper GI (single, double, water soluble)
    c. Oral Cholangiogram
2. Identify the necessary projections/positions employed by the technologist to demonstrate the following anatomy:
    a. Esophagus
    b. Stomach
    c. Duodenum
3. Discuss equipment and supplies necessary for each exam
4. Describe the patient education necessary for each exam including consent, preparation, & pre- and post-examination instructions
5. Describe the general procedure for each exam
6. List and describe the routine and special views for each study
7. List the common contrast media used, usual dosage and route of administration
8. Discuss appropriateness of contrast media to exams
9. For each procedure, list and identify the structures and/or function
10. Given radiographs, identify and evaluate related anatomy, centering, positioning and overall image quality
11. Identify the radiologic apparatus available to the technologist as well as the radiologist and how to prepare the x-ray room for the patient
12. Identify and describe the radiographic exams and common pathologies for the following exams:
    a. Small Bowel follow through (including enteroclysis)
    b. Barium Enema (single, double, water soluble)
13. Identify the necessary projections/positions employed by the technologist to demonstrate the following anatomy:
    a. Duodenum
    b. Jejunum
    c. Ileum
    d. Large Intestine
14. Discuss equipment and supplies necessary for each exam
15. Describe the patient education necessary for each exam including consent, preparation, & pre- and post-examination instructions
16. Describe the general procedure for each exam
17. List and describe the routine and special views for each study
18. List the common contrast media used, usual dosage and route of administration
19. Discuss appropriateness of contrast media to exams
20. For each procedure, list and identify the structures and/or function
21. Given radiographs, identify and evaluate related anatomy, centering, positioning and overall image quality
22. Identify the radiologic apparatus available to the technologist as well as the radiologist and how to prepare the x-ray room for the patient

Authors	Chp	Content	Pages
Module III		**Urinary System & Special Radiographic Procedures**	
Bontrager	14	Urinary System	526–533; 538-561
Bontrager	19	Special Radiographic Procedures	715 - 734
Ehrlich & Coakes	19	Special Radiographic Techniques	362 - 371
Objectives			

1. Identify and describe the radiographic exams, clinical indications, and common pathologies for the following exams:
    a. Intravenous urography
    b. Nephrotomography/Nephrograms
    c. Retrograde urography
    d. Cystography
    e. Cystourethrography
2. Identify the necessary projections/positions employed by the technologist to demonstrate the parts of the urinary system
3. State the functions of the urinary system
4. Describe the patient education necessary for each exam including consent, preparation, & pre- and post-examination instructions
5. List and describe the routine and special views for each study
6. List the common contrast media used, usual dosage, and route of administration
7. Discuss appropriateness of contrast media to exams
8. For each procedure, list and identify the structures and/or function
9. Given radiographs, identify and evaluate related anatomy, centering, positioning, and overall image quality
10. Identify and describe the radiographic exams and common pathologies for the following exams:
    a. Contrast arthrography (hip, knee, shoulder, wrist, TMJ)
    b. Hysterosalpingography
    c. Myelography
    d. Postoperative (T-Tube or Delayed) Cholangiography
    e. Endoscopic Retrograde Cholangiographic Pancreatography (ERCP)
    f. Long Bone Measurement
    g. Conventional tomography
11. Identify the necessary projections/positions employed by the technologist to demonstrate the anatomy of the female reproductive system
12. Describe patient preparation necessary for each exam
13. Describe general procedure for each exam
14. Describe the process for routine and special views for each exam
15. Discuss appropriateness of contrast media to exams
16. Given radiographs, evaluate positioning, centering, overall image quality, relevant anatomy, structures and/or functions
17. Discuss alternate procedures for exams (if any)
18. Analyze image by applying evaluation criteria provided in textbook for each position/projection

Authors	Chp	Content	Pages
Module IV		**Trauma, Mobile & Surgical Radiography Pediatric & Geriatric Radiography**	
Bontrager	15	Trauma, Mobile, & Surgical Radiography	563 - 618
Bontrager	16	Pediatric Radiography	619 - 646
Ehrlich & Coakes	20	Bedside Radiography	374 - 391
Ehrlich & Coakes	21	Radiography in Surgery	391 - 399
		Geriatric Considerations	No text

Objectives

1. Explain the principles of mobile radiography
2. Describe the basics of mobile x-ray machines
3. Cite advantages and disadvantages of both types of mobile units
4. Explain and demonstrate proper patient positioning for mobile projections presented
5. Explain and demonstrate the proper central ray and image receptor relations for the mobile projections presented
6. Analyze radiographs of essential projections by applying evaluation criteria provided in the textbook for each position/projection
7. Discuss exposure patterns and radiation protection surrounding the c-arm
8. Discuss maneuverability of the c-arm
9. Discuss skeletal trauma and fracture terminology for projections given
10. Discuss adaptations to common exams in trauma situations
11. Define the members of the surgical team and their roles
12. Explain proper surgical attire
13. Discuss methods used to maintain the sterile field during surgical radiographic examinations
14. Describe the orientation of the c-arm in relation to the patient for the most common fluoroscopic procedures in the operating room (OR)
15. Discuss common surgical radiographic procedures
16. Cite structures shown in each c-arm procedure
17. Describe the proper central ray and image receptor relationships for the most common mobile procedures in the OR
18. Analyze image by applying evaluation criteria provided in textbook for each position/projection
19. Discuss the radiographer's role in suspected cases of child abuse
20. Demonstrate proper immobilization techniques for pediatric procedures
21. Discuss common pediatric trauma pathologies
22. Discuss adaptations that may be necessary for exams on pediatric or geriatric patients
23. Discuss appropriate positioning accommodations for geriatric patients

Authors	Chp	Content	Pages
Module V		**Angiography & Interventional Radiography**	
Ehrlich & Coakes	22	Special Imaging Modalities	402 - 410
Bontrager	17	Angiography & Interventional Procedures	654 - 685
Objectives			

1. List and describe the duties of the:
    a. Physician
    b. Nurse
    c. Interventional radiologic technologist
2. Recognize the anatomy of the heart and vascular system on diagrams and images
3. Discuss alternative modalities and/or procedures
4. Discuss and describe the following examinations:
    a. Cerebral angiography
    b. Thoracic angiography
    c. Angiocardiography
    d. Abdominal angiography
    e. Peripheral angiography
    f. Interventional imaging procedures
        i. Vascular interventional angiography
        ii. Non-vascular interventional procedures
5. Delineate indications and contraindications for various angiographic procedures
6. Explain patient care techniques unique to angiographic and interventional procedures
7. Describe cardiac catheterization procedures including indications, contraindications, and patient monitoring
8. Describe the Seldinger technique and state its purpose
9. Identify various image post-processing functions
10. Describe structure and function of c-arm assembly
11. Describe structure and function of angiographic table
12. Describe structure and operation of contrast medium injection devices