North Central State College

MASTER SYLLABUS	2025-2026

A. Academic Division: Health Sciences

B. Discipline: Radiological Science

C. Course Number and Title: RADS2540 Radiologic Procedures/Seminar 5

D. Assistant Dean: Heidi Kreglow, PT

E. Credit Hours: 3
Lecture: 1
Seminar: 1
Laboratory: 3

F. Prerequisites: RADS 2420

Co-requisites: RADS 2520, RADS 2560

G. Last Course/Curriculum Revision Date: Spring 2025 Origin date: 02/11/2015

H. Textbook(s) Title:

Merrill's Atlas of Radiographic Positioning and Radiologic Procedures 3- volume Set
(Purchased in RADS1140)
- Author: Long, Rollins, & Smith
- Copyright Year: 2022
- Edition: 15th
- ISBN: 9780323832793

Quick and Easy Medical Terminology
(Purchased in RADS1140)
- Author: Leonard
- Copyright Year: 2024
- Edition: 10th
- ISBN: 9780323933469

Radiographic Pathology for Technologists
(Purchased in RADS1240)
- Author: Mace-Kowalczyk
- Copyright Year: 2021
- Edition: 8th
- ISBN: 9780323791298

Radiologic Science for Technologists
(Purchased in RADS1260)

- Author: Bushong
- Copyright Year: 2021
- Edition: 12th
- ISBN: 9780323661348

RadTechBootCamp - Clover Learning Student Plan, electronic resource

- Vendor: Clover Learning Inc.
- Copyright Year:2023
- Edition: n/a
- ISBN: 9781951294038

I. Workbook(s) and/or Lab Manual:

Merrill's Pocket Guide to Radiography (OPTIONAL)
(Purchased in RADS1140)

- Author: Long, Rollins & Smith
- Copyright Year: 2022
- Edition: 15th
- ISBN: 9780323832830

Merrill's Atlas of Radiographic Positioning and Procedures Workbook (OPTIONAL)
(Purchased in RADS1140)

- Author: Long, Rollins, Smith & Curtis
- Copyright Year: 2022
- Edition: 15th
- ISBN: 9780323832847

J. Course Description: This course is a capstone to all previous radiographic procedure courses. Students will be creating a radiographic case study and presenting the case to their peers. In addition, students will be required to complete final lab simulations to assess entry-level positioning skills. Some new information will continue to be presented such as radiographic procedures of the urinary and reproductive system. Pathology of the urinary and reproductive system will also be included to help students correlate the use of specific radiographic projections and their influence on the diagnosis of diseases. Laboratory exercises in an energized lab provide the student with practical application of the classroom material. Radiation biology will be discussed and its influence on radiation protection protocols. **Students will complete a Web-based research assignment investigating the impact of radiation accidents and their effect on human organisms.** Medical terminology is correlated with the content of the course. American Registry of Radiologic Technologies (ARRT) certification exam review will be conducted. A one-hour seminar will include various clinical topics.

Courses are taught in a hybrid format. The lecture and seminar portion are offered virtually using Canvas and Zoom technologies. The lab portions are taught on campus with face-to-face instruction and hands on practice.

K. College-Wide Learning Outcomes:

College-Wide Learning Outcome	Assessments - - How it is met & When it is met
Communication – Written	
Communication – Speech	
Intercultural Knowledge and Competence	
Critical Thinking	
Information Literacy	Information Literacy VALUE rubric mid-semester
Quantitative Literacy	

L. Course Outcomes and Assessment Methods:

Upon successful completion of this course, the student shall:

Outcomes	Assessments – How it is met & When it is met
1. Position the body for radiographic procedures of the urinary system on a person or phantom in a laboratory setting.	Lab exercises and lab simulation rubric weeks 1-15, Multiple exam study lab rubric weeks mid semester, Final lab simulation lab rubrics end of semester
2. Manipulate the radiographic equipment correctly for any radiographic procedure.	Lab exercises and lab simulation rubric weeks 1-15, Multiple exam study lab rubric weeks mid semester, Final lab simulation lab rubrics end of semester
3. Demonstrate correct radiation protection practices.	Lab exercises and lab simulation rubric weeks 1-15, Multiple exam study lab rubric weeks mid semester, Final lab simulation lab rubrics end of semester
4. Use appropriate and effective oral, written and nonverbal communications.	Lab exercises and lab simulation rubric weeks 1-15, Multiple exam study lab rubric weeks mid semester, Final lab simulation lab rubrics end of semester Agree and Disagree Homework for Radiation Biology Weeks 8-15
5. Identify anatomic structures demonstrated on radiographic images.	Written tests weeks 1-15, Image matrix weeks beginning of the semester, Image evaluation group activities weeks beginning of the semester
6. Evaluate medical images for positioning, centering, appropriate anatomy and technical accuracy.	Written tests weeks 1-15, Image matrix weeks beginning of the semester, Image evaluation group activities weeks beginning of the semester.
7. Determine the cause-and-effect relationship between positioning the body and achieving the required outcome on the completed image.	Written tests weeks 1-15, Image matrix weeks beginning of the semester, Image evaluation group activities weeks beginning of the semester
8. Explain the four primary dose response relationships	Class discussion and homework mid semester
9. Classify radiation-induced diseases as either stochastic or deterministic	Class discussion and homework weeks mid semester
10. Differentiate between direct and indirect effects of radiation interaction with the human body	Class discussion and homework end of semester
11. Discuss the principles of the target theory	Class discussion and homework end of semester
12. Demonstrate retention of skills by performing radiographic procedures of any selected body part on a person or phantom in the laboratory setting	Multiple exam study lab rubric mid semester, Final lab simulation lab rubrics weeks 10-15end of simulation
13. Demonstrate retention of all didactic and clinical information presented throughout the program by passing ARRT exam review tests	ARRT review written tests end of semester
14. References and uses appropriate resources for the Capstone case study	Information Literacy VALUE rubric for the reference page of the research paper for the Capstone Case Study mid semester

M. Recommended Grading Scale:

NUMERIC	GRADE	POINTS	DEFINITION
93–100	A	4.00	Superior
90–92	A-	3.67	Superior
87–89	B+	3.33	Above Average
83–86	B	3.00	Above Average
80–82	B-	2.67	Above Average
77–79	C+	2.33	Average
73–76	C	2.00	Average
70-72	C-	1.67	Below Average
67–69	D+	1.33	Below Average
63-66	D	1.00	Below Average
60-62	D-	0.67	Poor
00-59	F	0.00	Failure

N. College Procedures/Policies:

North Central State College believes that every student is a valued and equal member of the community.* Every student brings different experiences to the College, and all are important in enriching academic life and developing greater understanding and appreciation of one another. Therefore, NC State College creates an inclusive culture in which students feel comfortable sharing their experiences. Discrimination and prejudice have no place on the campus, and the College takes any complaint in this regard seriously. Students encountering aspects of the instruction that result in barriers to their sense of being included and respected should contact the instructor, assistant dean, or dean without fear of reprisal.

* *Inclusive of race, color, religion, gender, gender identity or expression, national origin (ancestry), military status (past, present or future), disability, age (40 years or older), status as a parent during pregnancy and immediately after the birth of a child, status as a parent of a young child, status as a foster parent, genetic information, or sexual orientation*

Important information regarding College Procedures and Policies can be found on the syllabus supplement located at
https://ncstatecollege.edu/documents/President/PoliciesProcedures/PolicyManual/Final%20PDFs/14-081b.pdf

North Central State College

SYLLABUS ADDENDUM

Academic Division:	Health Science	**Discipline:**	Radiological Sciences
Course Coordinator:	Dorie Ford		
Course Number:	RADS 2540	**Course Title:**	Radiologic Procedures/Seminar 5
Semester / Session:	Spring 2026	**Start / End Date:**	01/06/2026 – 05/05/2026

Instructor Information

Name:	Dorie Ford	**Credentials:**	M.ED, R.T.(R)(M)
Phone Number:	419-755-4886	**E-Mail Address:**	dford@ncstatecollege.edu
Office Location:	150 HS	**Office Hours:**	Monday 10:00 am -11:00 am, Tuesday 11:00 am to 12:00 pm and Thursday 11:00 am – 2:00 pm

I. Topical Timeline / Course Calendar (Subject to Change):

Weeks	Topics	Assignment	Due Date
1 1/13/26	Course Introduction	• Petition to graduate • OSRT Educational Symposium • Apply to take the registry exam	1/20/26
2 1/20/26	Intravenous Urogram	• Anatomy of the Urinary System note assignment • Preliminary Steps for Urinary Procedures note assignment • IVU Procedures student note assignment • Retrograde Urogram student note assignment	1/19/26
3 1/27/26	Cystogram	• Retrograde Cystogram and Voiding Cystogram student note assignment • Urinary Modality Presentation • ***Urinary Modality Quiz*** • ***Med Term Test- Urinary System***	1/26/26
4 2/3/26	Pathology of the Urinary System	• Pathology of the Urinary System student note assignment • Review Assessment #1 • ***Urinary Pathology Quiz*** • ***Med Term Test- Reproductive System***	2/2/26
5 2/10/26	Procedures and Pathology of the Reproductive System	• Reproductive System student note assignment • ***Test #1- Urinary System and Pathology***	2/9/26
6 2/17/26	Radiation Biology The Structure of Matter	• Atoms and Molecules reading assignment • Radioactivity and Ionizing radiation student note assignment • ***Med Term Test- Integumentary System***	2/16/26
7 2/24/26	Radiation Biology Human Biology	• Human Biology Student Note Assignment • Parts of the Cell assignment • ***Test #2- Reproductive System Radiology and Pathology***	2/23/26

Weeks	Topics	Assignment	Due Date
8 3/3/26	Radiation Biology Fundamental Principles of Radiobiology	• Fundamental Principles student note assignment • Fundamental Principles video assignment • Stochastic vs. Deterministic video assignment	3/2/26
Break 3/10/26			
9 3/17/26	Radiation Biology Molecular Radiobiology	• Molecular Radiobiology student note assignment • Review Assessment #2	3/16/26
10 3/24/26	Radiation Biology Cellular Radiobiology	• Cellular Radiobiology student note assignment • RTBC video assignment • ***Test #3 – The Structure of Matter, Human Biology and Fundamental Principles***	3/23/26
11 3/31/26	Radiation Biology Deterministic Effects of Radiation3	• Deterministic Effects student note assignment #1 • Deterministic Effects student note assignment #2 • OSRT Reflective Assignment	3/30/26
12 4/7/26	Radiation Biology Stochastic Effects of Radiation	• Stochastic Effects part #1 student note assignment • Stochastic Effects part #2 student note assignment • Radiation-induced Cancer Reading Assignment • Stochastic Effects part #3 • ***Test #4 – Molecular and Cellular Radiobiology***	4/6/26
13 4/14/26	Radiation Biology Heath Physics	• Health Physics student note assignment • ***Test #5 – Stochastic and Deterministic Effects of Radiation***	4/13/26
14 4/21/26	Final Exam Review	• Review of study guide	4/21/26
15 4/28/26	Final Exam		4/28/26
16 5/5/26	Mock Registry		TBD

II. Grading and Testing Guidelines:

Final Grade Calculation

Activity	Qty	Points	Percentage
Exams	5	29	60
Medterm Exams	3	72	
Final Exam	1	100	20

Other Graded Items			10
Student notes	18	360	
Reading Assignments	5	40	
Presentation	1	20	
Video Assignment	2	20	
Lab	15	100	10

1. **Introduction to the Course**
   a. Petition to Graduate
   b. OSRT Educational Symposium
   c. ARRT Registry Exam
   d. Lab Manual
2. **Urinary System Procedures and Pathology**
   a. Anatomy
   b. Procedures
   c. Image Evaluation
   d. Pathology
3. **Retrogram Cystogram and Voiding Cystogram**
   a. Procedures
   b. Image Evaluation
4. **Pathology of the Urinary System**
   a. Number and size anomalies
   b. Congenital and Inflammatory diseases
   c. Degenerative and Inflammatory diseases
   d. Neoplasms
   e. Urinary tubes and catheters
5. **Reproductive System**
   a. Reproductive procedures
   b. Reproductive pathology
6. **The Structure of Matter**
   a. Atoms and Molecules
   b. Radioactivity
   c. Ionizing radiation
7. **Human Biology**
   a. Parts of the cell
   b. Cell division
   c. Protein synthesis
8. **Fundamental Principles of Radiobiology**
   a. Physical principles
   b. Biological principles
   c. Stochastic vs. Deterministic
9. **Molecular Radiobiology**
   a. Radiation effects of macromolecules
   b. Radiation effects of DNA
   c. Radiolysis of water
10. **Cellular Radiobiology**
    a. Target Theory
    b. Cell cycle effects
11. **Deterministic Effects**
    a. Acute Radiation Lethality
    b. Local Tissue Damage
    c. Cytogenic Effects
12. **Stochastic Effects**
    a. Local Tissue Effects
    b. Life-span Shortening
    c. Risk Estimates
    d. Radiation-Induced Malignancies

e. Radiation and Pregnancy

13. **Health Physics**
    a. Cardinal Principles of Radiation Protection
    b. Effective Dose

III. <u>Examination Policy</u>:

1. Students must attend class when tests, oral presentations and written assignments are scheduled. If the student does not attend class on these days, the following deductions will be applied:
    a. First missed test = minus 5% from the earned score
    b. Second missed test = minus 10% from the earned score
    c. Third missed test = minus 15% from the earned score
    d. Additional missed tests= zero score

2. A student who logs in late for a test may not be permitted to take the test at that time. The test will then be treated as a make-up test with the appropriate deduction from the earned score

3. The reasons that a student may be excused from a test, oral presentation, written assignment or lab and not receive a deduction in the earned test score are as follows:
    a. Personal illness or illness of immediate family (doctor's excuse required)
    b. Personal hospitalization or hospitalization of an immediate family member (documentation required)
    c. Death in the immediate family (documentation required)

4. Course exams will be proctored over Zoom. The student will use two devices (phone and computer) while faculty proctor the exam.
    a. Each exam on Canvas creates a real-time log of the student's activities while in the exam tab. Exam logs are randomly checked by faculty after each test.
    b. Navigation away from the exam tab while taking the exam is not permitted for any reason.
    c. Any student who navigates from the exam tab during the exam:
        1. The first time- receives a zero on the test and a written warning from the faculty
        2. The second time- receives a zero on the test and will be subject to the Academic Misconduct process of the college

<u>Lab Grading Policy</u>

1. When a lab simulation is scheduled, students are expected to come to lab prepared to practice or perform the lab simulation. This means the student must read, study and practice the lab manual prior to lab and complete any pre-lab assignments.

2. A student must receive **80% (24/30)** or higher to pass a lab simulation. When a student fails a lab simulation these assumptions can be made:
    a. The student did not prepare for the lab simulation in advance by reviewing and practicing or:
    b. The student has weaknesses that must be identified and corrected so that these weaknesses do not degrade clinical performance.
3. Students who do not pass a lab simulation will be required to perform a repeat simulation. Repeat simulations are usually scheduled for the next scheduled lab.
    a. On a repeat simulation 10% will automatically be deducted from the final score. Students must pass the repeat simulation with **80% (24/30) after the 10% deduction**.
    b. If the student fails the repeat simulation, the student will receive a **zero** for that simulation

c. The student will be required to practice and simulate until the student has demonstrated, to the instructor, satisfactory skills on the exam.

4. If the student experiences an injury or undergoes a surgical procedure, the student must present a physician's release to participate in lab activities.

IV. Class Attendance and Homework Make-Up Policy:

1. Students are expected to attend every class. Attendance is taken.

2. In any circumstance where a student will miss class or lab, the student must send a message to the instructor through Canvas prior to the start of the class.

3. The instructor will contact the student via Canvas later in the day with instructions for the make-up test or class activity that was missed.
   a. Make-up tests are scheduled as close as possible to the date of the missed test.

4. Homework and other assignments receive full credit only when submitted on or before the due date and time.
   a. Late homework will receive a 50% deduction.
   b. Homework received late due to technology interruptions may receive a 50% deduction
   b. Homework will not be accepted after seven days post assignment due date.
   c. Homework may be excused if the student has the required documentation as mentioned above.

5. Students who fail to log in to class or log in late due to technology interruptions will be counted late or absent from the class and receive the deductions

6. Students who experience frequent technology interruptions will be asked to attend the virtual lectures from the college.

7. Students must attend every lab and wear the required dress code. Attendance is taken.
   1. Students who arrive late to lab will receive a late deduction

V. Classroom Expectations:

1. **Hybrid course delivery guidelines**
   a. It is expected that you have a designated learning space in your home, or wherever you receive your virtual course lecture.
   b. This would be a space free of distractors such as pets, children, spouses, siblings, parents, radio and television. In this space you will have adequate lighting, all electronic devices needed and textbooks and notes. **You will not be permitted to attend to these distractors during a test.**

2. **Zoom Lecture Expectations. Students will:**
   a. Be dressed, sitting up, and have the camera on unless otherwise instructed
   b. Go to the bathroom and remove your pets from the Zoom area before class
   c. Hoodies and blankets are not permitted during class or testing
   d. Mute your mic unless you would like to talk or ask questions.
   e. Complete the required weekly content before class and be prepared to participate in class
   f. Read the textbooks as directed and supplement class notes.
   g. Complete assignments by the due date. Pay attention to due dates.
   h. Have the required material on hand at the time of class (notes, books, etc.)

i. Participate in class discussions, ask and answer questions.
j. Review the day's material or complete other assignments as you wait for others to finish the test.
k. Stay on task when given in-class activities and group assignments. Review material if done early.
l. Demonstrate professional oral and written communication (discussion boards, emails to the instructor, class discussions, group activities)
m. Cell phone use is not permitted in hybrid courses or labs.
n. Treat classmates and the instructor with respect

3. **Course Resources**

a. Use all available resources wisely for class and lab activities, homework and exam preparation. The following are acceptable course resources:
   1. Recorded lectures/notes
   2. RTBC- any videos, lesson quizzes, assessments
   3. Practice Quizzes
   4. Worksheets
   5. Group Activities
   6. Discussion boards/class discussions
   7. Lab Manuals
   8. Tutoring/Instructors
   9. PowerPoint presentations
   10. Image Evaluation files/Lab Matrixes

4. Artificial Intelligence (AI)

a. Students are not permitted to use artificial intelligence (AI) for any course or lab activities unless permitted by the instructor.
b. If the instructor permits the use of AI, it will be communicated in writing on the assignment and an AI Acknowledgement Statement will be included https://ncstate.instructure.com/courses/1880576/files/331042541?wrap=1
c. Students who are caught using AI without permission for homework, notes or activities in class or lab will receive a zero for that assignment and a written warning.

5. **Communications**

a. Students must keep an open line of communication with Radiology faculty. At the beginning of the program, students will be assigned a radiology faculty advisor.
b. It is the student's responsibility to notify their faculty advisor if they would like to be referred to college services such as disability services, mental health services, financial aid, the resource navigator, TRIO, tutoring or any other services. In addition, if the program faculty sends an alert on the student's behalf, the student is expected to follow through with the recommendations resulting from the alert.
c. If the student is experiencing chronic health issues or an injury that influences their performance in class or lab, the student is expected to inform the course instructor.
d. The program faulty encourage open communication, however:

1. Communication to faculty after 9 pm on weekdays will be monitored, and if not deemed an emergency by the instructor, it will be answered the next business day.
2. Weekend communication to faculty will be monitored, and if not deemed an emergency or related to homework or a test on the next business day, will be answered on the next business day.
3. Turn-around time for communication from the faculty to student is usually very prompt, however, faculty have up to 48 hours to respond to messages