



INSTRUCTIONAL PACKAGE

RAD 210
Radiographic Imaging III

Effective Term
Fall 2024/Spring 2025/Summer 2025

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Part I: Course Information

Effective Term: Fall 2024/Spring 2025/Summer 2025

COURSE PREFIX: RAD 210

COURSE TITLE: Radiographic Imaging III

CONTACT HOURS: 3

CREDIT HOURS: 3

RATIONALE FOR THE COURSE:

This is an upper-level class in which the students will go beyond the boundaries of content specific material and integrate with their clinical experiences.

COURSE DESCRIPTION:

The course is a detailed study of advanced methods and concepts of imaging. The study of imaging equipment including tomography, fluoroscopy, computer radiography, digital radiography, and the study and performance of quality management techniques (QA & QC), radiology management, ethics, and law will be covered. In addition, image quality, x ray emissions and x ray interactions will be reviewed throughout the semester.

PREREQUISITES/CO-REQUISITES: RAD 115

REQUIRED MATERIALS: Required Textbook: - Radiologic Sciences for Technologists, Stewart Bushong, 12th ED.
- Radiologic Sciences for Technologists-Workbook, Stewart Bushong, 12th ED.

Recommended Textbook - Radiographic Imaging and Exposure, Terri Fauber, 6th ED, Elsevier

Please visit the [BOOKSTORE](#) online site for most current textbook information.

Enter the semester, course prefix, number and section when prompted and you will be linked to the correct textbook.

ADDITIONAL REQUIREMENTS:

Recommend utilizing RadTechBootCamp from Clover Learning Inc.

TECHNICAL REQUIREMENTS:

Access to Desire2Learn (D2L), HGTC's learning management system (LMS) used for course materials.

Access to myHGTC portal for student self-services.

College email access – this is the college’s primary official form of communication.

CLASSROOM ETIQUETTE:

As a matter of courtesy to other students and your professor, ***please turn off cell phones*** and other communication/entertainment devices before class begins. If you are monitoring for an emergency, please notify your professor prior to class and switch cell phone ringers to vibrate.

As a group we are with each other for a long time and sometimes with familiarity we can become too comfortable with one another, and we can display inappropriate behavior. Occasionally, we do not realize it is not appropriate for the classroom setting. Although we have a lot of policy and procedures already to follow, here is a review of proper classroom etiquette as adopted from Dr. Nardo of Ogelthorpe University. Demonstrating the following qualities shows respect for your professor and fellow students. It also upholds the integrity of the classroom.

1. Arrive on time to class.
2. Bring the materials needed for class.
3. ***Turn off cell phones*** and texting devices in class. First incident will result in a warning. A second incident you will be asked to leave the classroom and be charged an absence.
4. Use laptops/computers as it relates to classroom activities only.
5. Create appropriate emails accounts. Contact Dr. Gleasman at douglas.gleasman@hgtc.edu
6. Be attentive in class.
7. Dress appropriately.
8. Stay the entire class.
9. ***Do the work and avoid excuses/complaints.***
10. ***Use professional language and avoid sarcastic and in appropriate comments.***
11. Take your own notes and do your own work.
12. Avoid asking inappropriate or thoughtless questions. (Example: “What’s on the test?”, “Can we get out earlier today?”)

Abide by the honor and conduct code of HGTC as outlined in the College

NETIQUETTE: is the term commonly used to refer to conventions adopted by Internet users on the web, mailing lists, public forums, and in live chat focused on online communications etiquette. For more information regarding Netiquette expectations for distance learning courses, please visit [Online Netiquette](#).

Part II: Student Learning Outcomes

COURSE LEARNING OUTCOMES and ASSESSMENTS*:

The course provides the student with background knowledge relating to Tomography, Fluoroscopy, Digital Imaging and QC of digital images. Also the Ethical and legal issues related to Patient

Autonomy, Truthfulness and Confidentiality, Health Care Distribution and Diversity. Upon completion of the course the student will be able to:

1. Explain acquisition principles and imaging processes related to tomography, fluoroscopy, and digital imaging.
2. List the steps for transference of digital image to display of digital image
3. Explain the physics of digital image capture.
4. Explain the physics of digital image display
5. Describe the types of digital artifacts.
6. Analyze images for their radiographic quality content.
7. Share ethical and legal situations that you have encounter in your student career.
8. Describe ethical and legal dilemmas as they relate to confidentiality, patient autonomy, health care distribution, and diversity

Module #1 - Image Production

Materials Covered: Chapters: Bushong Chapters 14(p.258-264), 14-16, 25 and 26. Fauber Chapter 4.

***Assessment(s):** Complete class review activity.
Unit Test
Quizzes

Learning Outcomes:

1. Provide details and relationship between tomographic angle and section thickness.
2. Describe magnification radiography and its uses.
3. Discuss the development and evolution of fluoroscopy.
4. Explain visual physiology and its relationship to fluoroscopy.
5. Describe components of the image intensifier.
6. List appropriate kVp levels for common fluoroscopy.
7. Discuss the role of the charged couple device (CDC) in forming the fluoroscopic image.
8. Understand the advantages of using a flat panel image receptor.
9. Differentiate between types of image receptors used in CR and DR radiography.
10. Explain the relationship between sampling, frequency and spatial resolution.
11. Describe how the size of a CR imaging receptor can effect spatial resolution.
12. Recognize the differences between indirect and direct conversion of digital images.
13. Understand dynamic range, pixel pitch, pixel density, exposure latitude, and signal-to-noise ratio in relation to image quality.
14. Understand the differences in data processing of image production in CR and DR radiography.

Module 2 – Image evaluation

Materials Covered: Bushong textbook: Chapters 17, 18, 20-22
Handouts as provided by instructor.

***Assessment(s):** Complete in class assignment.

Unit tests, Quizzes, homework assignments.

Learning Outcomes:

1. Distinguish between spatial and contrast resolution.
2. Identify the use and units of spatial frequency.
3. Understand the concept of Modulation Transfer Function(MTF).
4. Discuss how post processing of the image allows for a wide dynamic range.
5. Describe the difference in hard copy vs. soft copy images.
6. Discuss the features of Liquid Crystal Display (LCD).
7. Describe pre-processing and post-processing of digital images.
8. Identify application of the picture archiving and communication system(PACS).
9. Define Quality Assurance (QA) and Quality Control (QC).
10. Describe the Quality Control tests associated with radiography.
11. Discuss types of digital radiographic artifacts and how to avoid them.
12. Describe the basis for data compression and the difference between lossless and lossy compression.
13. Explain how digital radiographic image artifacts and histogram errors occur due to improper collimation, partition or patient alignment.
14. Describe the factors associated with viewing images on digital devices and the quality control test utilized their maintenance.
15. Discuss the differences between soft tissue radiography and conventional radiography.
16. Describe the anatomy of breast tissue.
17. Identify the recommended intervals for breast self- examination and mammography.
18. Explain the difference between diagnostic and screening mammography.
19. Describe the unique features of a mammographic imaging system.
20. Discuss the requirements for compression in mammography
21. Safety precautions in Magnet Resonance Imaging (MRI).

Module 3 – Medical Ethics and Law in Radiologic Technology

Materials Covered: Handouts as provided by instructor.
Power Point Presentations

***Assessment(s):** Complete in class assignment.
Unit tests, Quizzes, Homework Assignments.

Learning Outcomes:

1. Understand and compare ARRT Rules of Ethics and Code of Ethics.
2. Describe the difference between Informed Consent, implied consent, and expressed consent and the medico-legal aspects in radiography.
3. Describe the patient autonomy and rights of the patient in medical imaging sciences.
4. Understand the meaning of various Medical Doctrines and the ramifications they have in healthcare.
5. Define definitions of essential medico-legal terminology associated with medic-ethics.
6. Write an essay depicting instances witnessed when medical ethics were adhered to and employees went above and beyond their job description and/ or situations where ethical codes

and rules were violated resulting in a breach of medical standards expected from a medical radiographer and the institution in which they are employed.

****Students – please refer to the Instructor’s Course Information sheet for specific information on assessments and due dates.***

EFFECTIVE PROFESSIONAL AND INTERPERSONAL COMMUNICATION (EPIC):

This course fulfills HGTC’s Quality Enhancement Plan for Effective Professional and Interpersonal Communication. Upon completion of this course, students will be able to:

(Check all that apply.)

- Utilize appropriate communication formats when conveying professional and interpersonal thoughts and ideas.
- Apply appropriate language when speaking and writing for their chosen field of study or Industry.
- Demonstrate appropriate communication techniques when engaging audiences.

Part III: Grading and Assessment

EVALUATION OF REQUIRED COURSE MEASURES/ARTIFACTS*:

Students’ performance will be assessed, and the weight associated with the various measures/artifacts are listed below. Most questions will be in a multiple-choice format, although short answer, true and false, matching and diagramming may be incorporated. Students are expected to be forthright and honest in their academic endeavors. Any form of academic dishonesty will be dealt with according to the HGTC’s policy on academic dishonesty. Performance will be assessed, and the weight associated with the various measures/artifacts are listed below.

EVALUATION*

Tests	50%	83-91 = B
Quizzes	20%	74-82 = C
Assignments/Homework	5%	65-73 = D
Final Exam	<u>25%</u>	<u>64 and below = F</u>
	100%	

****Students, for the specific number and type of evaluations, please refer to the Instructor’s Course Information Sheet.***

GRADING SYSTEM:

State the College’s or departmental grading system as delineated in the Catalog. Please note

the College adheres to a 10-point grading scale A = 100 – 90, B = 89- 80, C = 79 – 70, D = 69 – 60, F = 59 and below. You must have your Dean’s approval if changes in the scale are made.

Grades earned in courses impact academic progression and financial aid status. Before withdrawing from a course, be sure to talk with your instructor and financial aid counselor about the implications of that course of action. Ds, Fs, Ws, WFs and Is also negatively impact academic progression and financial aid status.

The Add/Drop Period is the first 5 days of the semester for **full term** classes. Add/Drop periods are shorter for accelerated format courses. Please refer to the [academic calendar](#) for deadlines for add/drop. You must attend at least one meeting of all of your classes during that period. If you do not, you will be dropped from the course(s) and your Financial Aid will be reduced accordingly.

Part IV: Attendance

Horry-Georgetown Technical College maintains a general attendance policy requiring students to be present for a minimum of 80 percent (80%) of their classes in order to receive credit for any course. Due to the varied nature of courses taught at the college, some faculty may require up to 90 percent (90%) attendance. Pursuant to 34 Code of Federal Regulations 228.22 - Return to Title IV Funds, once a student has missed over 20% of the course or has missed two (2) consecutive weeks, the faculty is obligated to withdraw the student and a student may not be permitted to reenroll. **Instructors define absentee limits for their class at the beginning of each term; please refer to the Instructor Course Information Sheet.**

Part V: Student Resources



THE STUDENT SUCCESS AND TUTORING CENTER (SSTC):

The SSTC offers to all students the following **free** resources:

1. **Academic tutors** for most subject areas, **Writing Center support**, and **college success skills**.
2. Online **tutoring** and academic support resources.
3. Professional and interpersonal communication **coaching** in the EPIC Labs.

Visit the [Student Success & Tutoring Center](#) website for more information. To schedule tutoring,

contact the SSTC at ssc@hgtc.edu or self-schedule in the Penji iOS/Android app or at www.penjiapp.com. Email ssc@hgtc.edu or call SSTC Conway, 349-7872; SSTC Grand Strand, 477-2113; and SSTC Georgetown, 520-1455, or go to the [Online Resource Center](#) to access on-demand resources.



STUDENT INFORMATION CENTER: TECH Central

TECH Central offers to all students the following free resources:

1. **Getting around HGTC:** General information and guidance for enrollment, financial aid, registration, and payment plan support!
2. Use the [Online Resource Center \(ORC\)](#) including Office 365 support, password resets, and username information.
3. **In-person workshops, online tutorials and more services** are available in Desire2Learn, Student Portal, Degree Works, and Office 365.
4. **Chat with our staff on TECH Talk**, our live chat service. TECH Talk can be accessed on the student portal and on TECH Central's website, or by texting questions to (843) 375-8552.



HGTC LIBRARY:

Each campus location has a library where HGTC students, faculty, and staff may check out materials with their HGTC ID. All three HGTC campus libraries are equipped with computers to support academic research and related school work; printing is available as well. Visit the [Library](#) website for more information or call (843) 349-5268.

STUDENT TESTING:

Testing in an **online/hybrid** course and in **make-up exam** situations may be accomplished in a variety of ways:

- Test administered within D2L.
- Test administered in writing on paper.
- Test administered through Publisher Platforms (which may have a fee associated with the usage)

Furthermore, tests may have time limits and/or require a proctor.

Proctoring can be accomplished either face-to-face at an approved site or online through our

online proctoring service. To find out more about proctoring services, please visit the [Online Testing](#) section of the HGTC's Testing Center webpage.

The **Instructor Information Sheet** will have more details on test requirements for your course.

DISABILITY SERVICES:

HGTC is committed to providing an accessible environment for students with disabilities. Inquiries may be directed to HGTC's [Accessibility and Disability Service webpage](#). The Accessibility and Disability Services staff will review documentation of the student's disability and, in a confidential setting with the student, engage in an interactive process to develop an educational accommodation plan.

Note: It is the student's responsibility to self-identify as needing accommodations and to provide acceptable documentation. After a student has self-identified and submitted documentation of a disability, accommodations may be determined, accepted, and provided. Students will need to reach out to the Accessibility and Disability Services staff each semester to renew their accommodations.

COUNSELING SERVICES:

HGTC Counseling Services strives to optimize student success through managing personal and academic concerns that may interfere with achieving educational goals. Staff are available to every student for assistance and guidance on personal matters, academic concerns and other areas of concern. HGTC offers free in-person and telehealth counseling services to students. For more information about counseling services, please reach out to counseling@hgtc.edu or visit the website the [Counseling Services webpage](#).

STATEMENT OF EQUAL OPPORTUNITY/NON-DISCRIMINATION STATEMENT:

Horry-Georgetown Technical College shall not discriminate in employment or personnel decisions or in student admissions or in student decisions, or in all other segments of the College community on the basis of race, color, sex, national or ethnic origin, age, religion, disability, marital or family status, veteran status, political ideas, sexual orientation, gender identity, or pregnancy, childbirth, or related medical conditions, including, but not limited to, lactation, in the educational programs and activities which it operates, and the college is prohibited from discrimination in such manner by applicable laws. Practices and requirements for nondiscrimination extend to the enrollment of students in programs and activities of the College and employment by the College.

All inquiries regarding the federal laws as they relate to discrimination on the basis of sex may be directed to Tamatha Sells, Title IX Coordinator, Horry-Georgetown Technical

College, Building 1100C, Room 107B, 2050 Hwy 501 E, PO Box 261966, Conway, SC 29528-6066, 843-349-5218, tamatha.sells@hgtc.edu or to the US Department of Education Office of Civil Rights. (Telephone: 800-421-3481/Email: OCR@ed.gov).

Other employee and applicant inquiries concerning the federal laws and their application to the College may be directed to Jacquelyne Snyder, Vice President, Human Resources and Employee Relations & the College's Affirmative Action/Equal Opportunity Officer, Horry-Georgetown Technical College, Building 200C, Room 205B, 2050 Hwy 501 E, PO Box 261966, Conway, SC 29528-6066, 843-349-5212, jacquelyne.snyder@hgtc.edu.

Other student and prospective student inquiries concerning the federal laws and their application to the College or any student decision may be directed to Dr. Melissa Batten, Vice President, Student Affairs, Section 504 & Title II Coordinator Horry-Georgetown Technical College, Building 1100C, Room 107A, 2050 Hwy 501 E, PO Box 261966, Conway, SC 29528-6066, 843-349-5228, melissa.batten@hgtc.edu.

TITLE IX REQUIREMENTS:

Title IX of the Education Amendments of 1972 protects students, employees, applicants for admission and employment, and other persons from all forms of sex discrimination.

HGTC prohibits the offenses of domestic violence, dating violence, sexual assault, and stalking and will provide students, faculty, and staff with necessary information regarding prevention, policies, procedures, and resources.

Any student, or other member of the college community, who believes that they have been a victim of sexual harassment, domestic violence, dating violence, sexual assault, or stalking may file a report with the college's Title IX Coordinator or campus law enforcement*.

*Faculty and Staff are required to report these incidents to the Title IX Coordinator when involving students. The only HGTC employees exempt from mandatory reporting are licensed mental health professionals (only as part of their job description such as counseling services).

For more information, contact Tamatha Sells, Title IX Coordinator, Conway Campus, Building 1100C, Room 107B, 843-349-5218, tamatha.sells@hgtc.edu.

PREGNANCY ACCOMMODATIONS

Under Title IX, colleges must not exclude a pregnant student from participating in any part of an educational program. Horry-Georgetown Technical College is committed to ensuring that

pregnant students receive reasonable accommodations to ensure access to our educational programs.

Students should advise the Title IX Coordinator of a potential need for accommodations as soon as they know they are pregnant. It is extremely important that communication between student, instructors, and the Title IX Coordinator begin as soon as possible. Each situation is unique and will be addressed individually.

Title IX accommodations DO NOT apply to Financial Aid. Financial Aid regulations do not give the College any discretion in terms of Financial Aid eligibility.

Certain educational programs may have strict certification requirements or requirements mandated by outside regulatory agencies. Therefore, in some programs, the application of Title IX accommodations may be limited.

To request pregnancy accommodations, please complete the [**Pregnancy Intake Form**](#).