



# INSTRUCTIONAL PACKAGE

RAD 210

Radiographic Imaging III

201910

Fall 2019

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## Part I: Course Information

Effective Term: 201910 Fall 2019

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.

**PREREQUISITES/CO-REQUISITES:** RAD 115

### **REQUIRED MATERIALS:** Textbooks:

- Radiologic Sciences for Technologists, Stewart Bushong, 11<sup>th</sup> ED.
- Radiographic Imaging and Exposure, Terri Fauber, 4thED, Mosby

Please visit the Bookstore online site for most current textbook information. Use the direct link below to find textbooks.

[BOOKSTORE](#).

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

### **ADDITIONAL REQUIREMENTS:**

In addition, image quality, x ray emissions and x ray interactions will be reviewed throughout the semester.

### **TECHNICAL REQUIREMENTS:**

Access to Desire2Learn (D2L), HGTC's student portal for course materials.  
WaveNet and D2L email access.

## **CLASSROOM ETIQUETTE:**

### **CLASSROOM ETIQUETTE:**

Suggested text, delete section if you don't plan to use.

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 from your wavenet account. Contact Dr. Gleasman at [douglas.gleasman@hgtc.edu](mailto: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

## **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 13(p.258-264), 14-16, 25 and 26. Fauber Chapter 6.

**\*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 (CCD) 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' perform Questions will be based on knowledge, comprehension, application, analysis and evaluation skills. 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.

<u>EVALUATION*</u>		<u>Grading Scale: 92-100 = A</u>
Tests	50%	83-91 = B
Quizzes	20%	74-82 = C
Assignments/Homework	5%	65-73 = D
Final Exam	25%	64 and below = F
	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.

Any student receiving a grade below 75% on a unit test or a 70% on a quiz will be required to make a **mandatory appointment** with the course instructor or radiology tutor to review the material which was not well understood on the examination or quiz. If the tutor is not available, the student will meet with the course instructor.

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 ([ACADEMIC CALENDAR](#)). 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. Horry-Georgetown Technical College maintains a general attendance policy requiring students to be present for a minimum of eighty percent (80%) of his or her classes in order to be eligible to receive credit for any course. However, due to the varied nature of courses taught at the College, a more rigid attendance policy may be required by individual instructors. Students at HGTC are responsible for all course work and assignments. Attendance is a must. In this course a student may not exceed more than 2 absences as the \*Radiography Program requires a 90% attendance. An oral warning results after your **first absence**. A **second absence** results in a written warning. A **third absence** results in a final written warning. Any further absences are grounds for dismissal. If a student is absent on the day of a test or quiz, the student must notify the instructor and the Grand Strand testing center within 24 hours to schedule a makeup exam. Make up exams may be administered in several different formats; multiple choice, matching, fill in the blank, short answer or essay. A student who is absent a second time on a test day must present a valid written, dated excuse for the absence in order to make up the test/quiz. A student who is absent from a class prior to an examination on the same day will not be allowed to take the examination on that day and he/she is responsible for contacting the instructor to schedule a make-up examination.

At a minimum, a student may be withdrawn from a course(s) after he or she has been absent in excess of ten percent (10%) of the total contact hours for a course. **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 coaches** for most subject areas, **Writing Center Support**, and **college success skills**.
- 2. On-line student success and academic support resources.**

Visit the SSTC website: [Student Success & Tutoring Center](#) and visit the student services tab in your WaveNet account to schedule appointments using TutorTrac. For more information, 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 any time.

## **TECH Central – Student Information Center**



TECH Central provides quality enrollment and collegiate guidance for students, faculty, and staff. Services include phone, walk-in, and online technical support for technology training and troubleshooting. Additionally, we offer support in Office 365, Outlook E-mail setup, and ID cards.

**Phone:** 843-349-5340

**Email:** [techcentral@hgtc.edu](mailto:techcentral@hgtc.edu)

**Text:** 843-357-8552

**TECH Talk (Live Chat):** Located on the "Home" tab in WaveNet.

**Website:** [www.hgtc.edu/techcentral](http://www.hgtc.edu/techcentral)

### **Locations:**

Conway Building 1100, Room 132D

Grand Strand Building 200, Room 136

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 Beth Havens, Director of Student Development on the Conway Campus Jaime Davis, Counselor/Advisor on the Georgetown Campus or Kristin Griffin, Counselor on the Grand Strand Campus. These individuals will review documentation of the student's disability and, in a confidential setting with the student, 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.

## **Statement of Equal Opportunity/Non-Discrimination Statement**

Horry-Georgetown Technical College prohibits discrimination and harassment, including sexual harassment and abuse, 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 educational programs and/or activities.

Inquiries regarding the non-discrimination policies: Students and prospective student inquiries

concerning Section 504, Title II, and Title IX and their application to the College or any student decision may be directed to the Vice President for Student Affairs, Dr. Melissa Batten, VP Student Affairs, Title IX Coordinator, Building 1100, Room 107A, Conway Campus, PO Box 261966, Conway, SC 29528-6066, 843-349-5228, [Melissa.Batten@hgtc.edu](mailto:Melissa.Batten@hgtc.edu). Employee and applicant inquiries concerning Section 504, Title II, and Title IX and their application to the College may be directed to the Vice President for Human Resources, Jacquelyne Snyder, VP Human Resources, Section 504, Title II, and Title IX Coordinator, Building 200, Room 212A, Conway Campus, PO Box 261966, Conway, SC 29528-6066, 843-349-5212, [Jacquelyne.Snyder@hgtc.edu](mailto:Jacquelyne.Snyder@hgtc.edu).

**Title IX Requirements**

All students (as well as other persons) at Horry-Georgetown Technical College are protected by Title IX—regardless of their sex, sexual orientation, gender identity, part- or full-time status, disability, race, or national origin—in all aspects of educational programs and activities. Any student, or other member of the college community, who believes that he/she is or has been a victim of sexual harassment or sexual violence may file a report with the college’s Chief Student Services Officer, campus law enforcement, or with the college’s Title IX Coordinator, or designee.

\*Faculty and Staff are required to report incidents to the Title IX Coordinators 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).

<b>Inquiries regarding the non-discrimination policies:</b>	
Student and prospective student inquiries concerning Section 504, Title II, and Title IX and their application to the College or any student decision may be directed to the Vice President for Student Affairs.	Employee and applicant inquiries concerning Section 504, Title II, and Title IX and their application to the College may be directed to the Vice President for Human Resources.
<p><b>Dr. Melissa Batten, VP Student Affairs</b>  <i>Title IX Coordinator</i></p> <p>Building 1100, Room 107A, Conway Campus          PO Box 261966, Conway, SC 29528-6066          843-349-5228  <a href="mailto:Melissa.Batten@hgtc.edu">Melissa.Batten@hgtc.edu</a> _</p>	<p><b>Jacquelyne Snyder, VP Human Resources</b>  <i>Section 504, Title II, and Title IX Coordinator</i></p> <p>Building 200, Room 212A, Conway Campus          PO Box 261966, Conway, SC 29528-6066          843-349-5212  <a href="mailto:Jacquelyne.Snyder@hgtc.edu">Jacquelyne.Snyder@hgtc.edu</a></p>

***“Ability is what your capable of doing.  
 Motivation determines what you do  
 Attitude determines how well you do it”***

**Lou Holtz**

