

**Bergen Community College  
Division of Health Professions  
Department of Radiography**

**Course Syllabus**

**RAD 280 – Principles of Image Production and Acquisition**

**Basic Information About Course**

Course Typically Offered: Summer  
Semester and Year: Summer U, Year 1  
Course and Section Number: RAD 280-001,-002,-003  
Locations: HP-124

**Course Description**

This course involves the study of the theoretical and practical aspects of image creation. The photographic, geometric, and imaging systems will be explored. Evaluation of changes caused in the radiographic image with equipment and recording systems, demonstrated, and discussed. Also included in this course are the basic concepts of the origin and effects of ionizing radiation on the patient and radiographic image.

Credits – 3 CR, Lecture [2.00] Laboratory [3.00]  
Prerequisites - RAD 181 Radiography I  
RAD 182 Radiography Practicum I  
RAD 276 Principles of Imaging Equipment  
Co Requisites - RAD 283 Summer Radiography Practicum

**Student Learning Objectives:** As a result of meeting the requirements in this course, students will be able to:

1. Identify, describe, and explain the functions of image acquisition equipment.
2. Perform imaging procedures according to imaging standards. Adjust the procedure based on the limitations of the patient and equipment.
3. Identify and critique a radiographic image based on grayscale, brightness, and radiation exposure.
4. Educate a patient before a procedure on the risks and benefits of radiographic imaging.

5. Apply their knowledge of radiation safety to protect the patient and participating occupational workers.

### **Means of Assessment**

Students in this course will:

1. Complete two tests in addition to a midterm and final examination in class.
2. Demonstrate their understanding of material through discussion and simulation.
3. Demonstrate their understanding of material through the design and creation of a radiation exposure project.
4. Demonstrate their understanding of material through a laboratory practical examination (skills).

### **Course Content**

During the summer semester, radiography students will continue to develop an entry level knowledge of components, principles of digital imaging systems, and operation of electronic equipment found in diagnostic radiography. Factors that impact image acquisition, display, archiving, and retrieval are discussed. Principles of digital imaging systems and quality assurance are introduced. Students will demonstrate their knowledge of patient care, positioning, and equipment through imaging in the laboratory.

### **Course Texts and/or Other Study Materials**

Bushong, Stewart C. *Radiologic Science for Technologists 12th Edition*, Mosby, 2020. ISBN 978-0-323-66134-8

Callaway, William. *Mosby's Comprehensive Review of Radiography: The Complete Study Guide and Career Planner 8th Edition*. Mosby, 2022. ISBN 978-0323694889

### **Research, Writing, and/or Examination Requirement(s)**

#### **Quizzes, Short Writing Assignments**

Students may be given short writing assignments or quizzes to complete. Timelines for completion will be determined by the course instructor.

**Written Examination**

The written examination will be objective, computerized tests that demonstrate the student's ability to identify and apply course and program material. Students will be expected to evaluate various imaging scenarios and determine the appropriate modifications to imaging. Students will be able to demonstrate their knowledge of radiography.

**Laboratory Practical**

Students will be asked to demonstrate their ability to read and interpret a patient care scenario. They will use this information to create a radiographic study in the laboratory setting. Students will manipulate computer equipment, radiography equipment, and various medical supplies to achieve the requested digital x ray images. Finally, students will evaluate their images to determine areas of improvement, diagnostic quality, and any associated anatomy and physiology.

**Grading Policy****Recommended Grade Structure**

Description	Total Percentage
Test 1	20%
Midterm (Test 2)	20%
Test 3	20%
Final Exam (Test 4)	20%
Class Attendance & Participation	5%
Laboratory Attendance & Participation	5%
Laboratory Practical Evaluation	10%

The Radiography program grading scale is outlined in the program handbook available here <https://bergen.edu/radiography/more-info/>

**Recommended Policy for Late Assignments:**

Students will receive a deduction of 5% of the final grade for the assignment for each day late.

## **Attendance Policy**

### **BCC Attendance Policy:**

All students are expected to attend every scheduled meeting of each course in which they are registered. Attendance and lateness policies and sanctions are to be determined by the instructor for each section of each course. These will be established in writing on the individual course outline. Attendance will be kept by the instructor for administrative and counseling purposes.

### **Attendance Policy for this Course**

Attendance is determined using the following calculation:

Attendance score = # of classes attended / total number of classes held in the semester

## **Other College, Divisional, and/or Departmental Policy Statements**

### **Accommodations for Disabilities:**

Bergen Community College aims to create inclusive learning environments where all students have maximum opportunities for success. Any student who feels he or she may need accommodation based on the impact of a disability should contact the Office of Specialized Services at 201-612-5269 or via email at [ossinfo@bergen.edu](mailto:ossinfo@bergen.edu) for assistance.

### **Statement on Mental Health and Wellbeing**

Mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. Bergen Community College has licensed Personal Counselors available to assist you with addressing these and other concerns you may be experiencing.

You can learn more about the confidential mental health services available on campus via the Health and Wellness Center at [www.bergen.edu/personalcounseling](http://www.bergen.edu/personalcounseling)

**BCC Statement on Plagiarism:** Plagiarism is a form of academic dishonesty and may be a violation of U.S. Copyright laws. Plagiarism is defined as taking someone else's words, opinions, or ideas and claiming them as one's own.

Examples of plagiarism include instances in which a student:

- knowingly represents the work of others as his/her own
- represents previously completed academic work as current
- submits a paper or other academic work for credit which includes words, ideas, data or creative work of others without acknowledging the source
- uses another author's exact words without enclosing them in quotation marks and citing them appropriately

- paraphrases or summarizes another author's words without citing the source appropriately

Instructors may define their own policies regarding plagiarism. See the Academic Regulations section of the college catalog for college policies.

### **Available Online and On-Campus Resources**

Office of Testing and Tutoring at the Meadowlands LYN 202

<https://bergen.edu/tutoring/tutoring-testing-center-at-the-meadowlands/>

The Writing Center and Tutoring Center L-125 <https://bergen.edu/tutoring/writing-center/>

OWL (Online Writing Lab) <http://www.owl.english.perdue>

The English Language Resource Center (ELRC) C-212

<https://bergen.edu/tutoring/english-language-resource-center/>

The Library <https://bergen.edu/library/>

MLA Formatting Guides <https://bergen.libguides.com/citationguides/mla>

Library Research Guides <https://bergen.libguides.com/index.php?b=s>

Free Time Computer Labs <https://bergen.edu/technology-assistance/computer-lab-availability/>

The Center for Student A-118 (Academic, Career, International, and Transfer Counselors)

<https://bergen.edu/center-for-student-success/>

Academic Support <https://bergen.edu/academics/pathway-scholars-program/academic-support/>

Personal Counseling HS-100

<https://bergen.edu/health-wellness-and-personal-counseling/personalcounseling/>

## Sample Course Outline

Week	Topic/Activity	Assignment/Events
1	Orientation & Digital Radiography Characteristics	Lab - Chest & Thorax Imaging
2	Digital Radiography Characteristics & Flat Panel Digital Fluoroscopy	Lab - Chest & Thorax Imaging
3	<b>Test 1</b>	Lab - Abdominal Imaging
4	X Ray Production	Lab - Upper Extremity
5	Technical Factors	Lab - Upper Extremity / Lower Extremity
6	<b>Midterm</b>	Lab - Lower Extremity
7	Scatter Control	Lab - Lower Extremity
8	Digital Image Processing	Lab - Spine
9	<b>Test 3</b>	Lab - Spine
10	Radiographic Exposure Selection	Lab - Practical Examination
11	Imaging Considerations	
12	<b>Final Examination</b>	

Important dates for the semester can be found at  
<https://bergen.edu/events/category/academic-calendar/list/>

**Note to Students:** This Course Outline and Calendar is tentative and subject to change, depending upon the progress of the class.

**Date of Most Recent Syllabus Revision: 04/2024**