

Bergen Community College  
Division of Health Professions/ Radiography Program

**Course Syllabus and Course of Study for Lecture**

**Course Information:**

Course title: Advanced Imaging Equipment and Patient Care  
Course Code: RAD 184  
Credits: 2.0 (30 lecture hours)  
Pre-requisites: RAD 276 - Imaging Equipment  
RAD 281 - Radiography II  
RAD 283 - Intermediate Radiography Clinical

**Co-requisites:** RAD 285 - Radiography III  
RAD 286 - Radiography Clinical III  
RAD 183 - Radiographic Pathology

**Instructor:**

Professor Joseph A. Mamatz, Jr.  
Educational Program Director and Academic Chair  
Email: [jmamatz@bergen.edu](mailto:jmamatz@bergen.edu) Phone: 201-493-5025, Office: L114

**Course Description:**

A course that focuses on advanced diagnostic imaging systems and equipment, quality management and patient care practices. Topics of this course include advanced principles of pharmacology, venipuncture, contrast media and complications. This is an exploration of all imaging equipment and quality management practices.

**Student Learning Objectives:**

Upon completion of this course, the student radiographer will be able to:

- Identify and describe the components of the digital radiography, computed radiography and PACS
- Explain and demonstrate proper venipuncture technique.
- Correlate the imaging equipment to the mechanism for evaluating its functional capability.
- Identify various contrast agents used and identify potential contraindications.
- Identify the use of all medical pharmaceuticals used in medical treatment.
- State and explain the quality control practices for patient care, imaging equipment, image processing and related artifacts

**Textbook:**

Authors: James N. Johnston & Terri L. Fauber  
Text: Essentials of Radiographic Physics and Imaging  
Edition: 1<sup>st</sup>  
Publisher: Mosby/ Elsevier

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**Grading Policy and Course Requirements:**

Components	Percent Weight of the final grade
Test 1- Digital Imaging- CBT	15%
Test 2- Quality Control -CBT	15%
Test 3- Advanced Patient Care- CBT	15%
Content Specification Outline, Equipment, Section 1	10%
Content Specification Outline, Equipment, Section 2	10%
Content Specification Outline, Equipment, Section 3	10%
Comprehensive Course Final Examination	25%
Total	100%

**CBT (computer-based test)**

There will be no paper test. You are permitted to see the test/ examination only the presence of the Educational Program Director by appointment only.

ARRT Content Specifications Hyperlink

<https://www.arrt.org/pdfs/Disciplines/Content-Specification/RAD-Content-Specification.pdf>

***Grade Assignment Protocol and Policy***

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Letter grades for each radiography course are assigned as follows:

A	92-100
B+	89-91
B	83-88
C+	80-82
C	75-79
F	74 and below

In this course, a combined average of 75% on the three combined (3) and final examination MUST be achieved; regardless of quizzes, tests, discussion, lab, activities, attendance or discussion.

**Progression in Courses**

All clinical courses are to be taken in sequence with its appropriate didactic portion of the curriculum. Student MUST earn a minimum grade of C (75%) or better in both the didactic and clinical courses in each semester in order to progress to the next level of professional studies.

An unsuccessful attempt may only be repeated once. Students will be permanently dismissed from the program when any two radiography courses not successfully passed with no chance for re-admissions.

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**Student Accountability Policy**

Students are expected to be present and attentive. You are responsible for your performance. An electronic written warning will be sent to your mail. Please make sure the email is private.

Please make note that the grading scale has been change. This instructor will not entertain issues of excuses for poor performance. My expectations are high for my teaching, so I expect the same from you. There are NO makeup tests or exams. Extenuating circumstances will be reviewed by an appointed committee. Students who withdraw from any course in the program are subject to the re-application process for re-entry to the program.

***Student Learning Modules- Course Subject Matter***

In RAD 184, there are three major modules of study are:

- digital imaging
- quality control and assurance
- advanced patient care management and education
- Final Comprehensive Examination

**Part 1: Digital Imaging**

**Weeks 1-6**

- Computer technology, digitizing data, image storage
- Field of view, matrix, pixels and voxel
- Computed radiography, image plate, reader, scanner and conversion processes
- Photo-stimulated luminescence (PSL), photomultiplier tubes
- Terminology related to digital and computed radiography
- Digital radiography, digital fluoroscopy, direct readout detector, indirect readout detector, processes
- Ambient lighting, image brightness, resolution, gray scale
- Image stitching, contrast resolution and noise
- Quantum detection efficiency, look up table, PACS
- Contrast, fading, brightness control, window level, window width
- Artifacts; scratches, heat blur, banding, pixel failure, ghosting, collimation, partitioning,
- Grid usage, printer artifacts
- DICOM, RIS and HIS
- DR/ CR

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**Part 2: Quality Control Module**

**Weeks 7-10**

- Introduction to quality control and quality assurance
- Personnel, instruments & materials used
- Overload indication, timers, KV accuracy
- Linearity and reproducibility
- Focal spot size determination
- AEC, warm up procedures, filtration
- Beam alignment, tomography and fluoroscopic x-ray units
- Repeat analysis
- Automatic processors
- Processing
- Film artifacts; prevention
- Digital Image artifacts; prevention

**Part 3: Advanced Patient Care**

**Weeks 11-14**

- Definition of pharmacology, absorption and physiological effects
- Safe medication administration protocol
- Routes of administration
- Controlled, over the counter medication
- Drugs and their uses
- Vessels
- Localization of the vessels
- Venipuncture technique
- Contrast medias; interactions and medical emergency care
- Routes of administrations

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- Indication and contraindications for contrast administration
- Side effects and allergic responses
- System/ study correlation to contrast agent

**Part 4: Final Exam**

Week 15

- Comprehensive, Computer-Based Final Exam

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**Course Policies (Important)**

**Notice of Changes Policy**

The student is apprised that this document is subject to change. When any change is made the instructor will notify you in class or electronically.

**Final Examination Policy**

In order to pass this course, the student must acquire a 75% average on the final examination and 3 tests together. In the event the student fails to do so, the grade assigned for the course would be an F grade, regardless of the grades acquired on any other assessment used in this course.

**Attendance Accountability Policy**

There are NO tests or examination. You are expected to be present and on time when an assessment is given. The student must allow for travel time and issues the might arise.

- Lateness for an assessment is subject to an automatic -10 point deduction from the assessment when it is scored.
- -2 points for each tardy event
- -2 points for each unexcused early departure
- -3 points for each unexcused absence

A medical doctor's note does NOT excuse the absence; it just provides the reason for the absence. Medical notes need not provide sensitive personal information.

**Web Enhancement**

Students are expected to act in a professional manner at all times while in class, lab and the clinic. Netiquette is to be used for all responses in written documents on Moodleroom. Students are expected to read all announcements and email every day to keep abreast.

**Attendance Policy**

Extenuating circumstance if this is the cases the MUST be discussed with the instructor. The rationale for our attendance and progression policies is to help you achieve success with the course and clinical performance. Absences and consistent tardiness affects course and clinical performance. See above policy.

**Electronic Devices**

- I-pads and laptops are to be used for educational purposes only while in class.
- Cell phones, i-phones are not to be used in the classroom.
- Assessment tools are not to be photographed under any circumstance.
- Materials and equipment may not be photographed without permission of Bergen Community College officials.
- ANY violation of this policy will be brought to the Deans of Health Professions and Judicial Affairs.

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**Course Syllabus and Course of Study for Lecture**

THE STUDENT IS ADVISED THAT A FINAL GRADE OF 75% OR HIGHER IS NEEDED TO PASS THIS COURSE. IN ADDITION, THE INFORMATION ON THIS SYLLABUS IS SUBJECT TO CHANGE.

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**Course Syllabus and Course of Study for Lecture**

Print Name: \_\_\_\_\_

Sign your name: \_\_\_\_\_

Date: \_\_\_\_\_

By writing your initials below, I have read and agree to comply with the following policies:

**Notice of Changes Policy \_\_\_\_\_ (initial)**

The student is apprised that this document is subject to change. When any change is made the instructor will notify you in class or electronically.

**Final Examination Policy \_\_\_\_\_ (initial)**

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- ANY violation of this policy will be brought to the Deans of Health Professions and Judicial Affairs.

\_\_\_\_\_ (initial) THE STUDENT IS ADVISED THAT A FINAL GRADE OF 77% OR HIGHER IS NEEDED TO PASS THIS COURSE. IN ADDITION, THE INFORMATION ON THIS SYLLABUS IS SUBJECT TO CHANGE.

\_\_\_\_\_  
Signature