
COURSE INFORMATION

Course Title: RAD 280-001
Semester: Summer 2016
Credits: 3.0
Hours: 45 hours over a span of 12 weeks; **3.75 hours per week.**
Monday; 8 am to 11:45 am
Prerequisites: RAD 281, RAD 282, and RAD 276
Co-requisites: RAD 283
Course Instructors: Professor Joseph Mamatz
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Primary Course Instructor
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COURSE DESCRIPTION

Image Production and Evaluation is the study of the theoretical and practical aspects of radiographic equipment and recording systems. The photographic and geometric characteristics of diagnostic radiographic image are presented. 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. These topics are supported through the performance of laboratory experiments and radiography based computer software.

STUDENT LEARNING OBJECTIVES

Upon completion of this course, the radiography student should be able to:

- Describe the structure and function of each part of the x-ray tube and relate such information to the production of x-radiation.
- Explain the characteristics of ionizing radiation and relate each component to the formation of the image and radiation safety practices.
- Differentiate the two major aspects of distortion and indicate factors that influence its formation.
- Explain how factors such as mA, exposure time, part-film distance, source-image distance, focal spot size, grids, filtration, receptors, collimation, motion, anode heel effect, patients, pathology and tube alignment effect image quality.
- Apply the principles of image production to clinical related conditions and circumstances.
- Differentiate technique compensation from density maintenance.
- Formulate a basic technique chart using established forms of charts, such as fixed v. variable technique charts.
- Determine the effect of patient measurement on the selection of Exposure factors.
- Describe basic technique adjustments that are needed for pediatric and geriatric patients, casts and contrast agents.
- Differentiate low from high contrast radiographs.

- Identify and describe the basic parts of film and intensifying screens.
- Identify and explain the functions of the parts of the automatic processor.
- Identify basic image artifacts and indicate its cause and correction.
- Perform the following calculations in a competent manner:
 - mAs
 - mAs-distance formula
 - grid conversions
 - inverse square law
 - determination of beam penetration
 - 15% rule (mAs-kVp relationship)
 - greatest/ least density
 - greatest/ least contrast
 - greatest/ least recorded detail
 - greatest/ least distortion
 - visible changes
 - casts, pathology, pediatric and geriatric cases/ conditions
 - % magnification
- Identify the film's contrast, latitude and speed using data from a characteristic curve.

REQUIRED COURSE TEXTBOOKS

Wallace, Jerry Ellen (1995) Radiographic Exposure: Principles and Practice.
F.A. Davis Company (Philadelphia) ISBN: 0-8036-0051-8

Fosbinder and Orth (you already have this book from RAD 276)

GRADING POLICY, COURSE REQUIREMENTS AND ASSIGNED GRADES

The final course grade for RAD 280 is derived from the following assessment areas below:

- 20% Test I
- 20% Test II
- 25% Midterm Exam
- 35% Final Examination

- Students are to be apprised of the programs attendance policy.
- Assignments are indicated throughout this outline and should be completed *prior* to the due date.
- Any Reading assignments given **MUST** be done *prior* to the related lecture.
- The instructor will *not* accept any late assignments after the assigned due date.
- Students benefit from the assignments for it provides a mechanism to apply concepts introduced, explained and reinforced in class.
- A final grade will be assigned based on the final average from the components indicated above.
- Grades are assigned as follows based on the policy that is published in the Radiography Student Handbook.

Electronic Devices and Phones

Cell phones are not permitted in the classroom during class. You may either not bring the phone to class or place it into the basket in the front of the classroom. In case of an emergency one may contact you using 201.447.7100. Direct the operator extensions 1150, 3393 may be used.

LEARNING UNITS

- Week 1: Film and Imaging Systems; conventional, CR and DR
Wallace, Chapter 12
- Week 2: Automatic Processor
Wallace, Chapter 12
- Week 3: Patients, mAs; reciprocity and anode heel effect
Wallace, Chapter 5
- Week 4: kVp/ MAS relationship
Wallace, Chapter 8
- Week 5: Distance; OID and SID
Wallace, Chapter 6
- Week 6: Midterm Examination and Contrast
Wallace, Chapter 7
- Week 7: Scatter Control; Grids
Wallace, Chapters 9-10.

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- Week 8: Recorded detail, resolution, spatial resolution
Wallace, Chapter 11
- Week 9: Distortion; size and shape
Wallace, Chapters 3 and 4
- Week 10: Technique Charts
Wallace, Chapter 17
- Week 11: Technique calculations & Manipulation; course review
Wallace, Chapter 18
- Week 12: Final Examination

** Please be advised that all reading and relevant assignments are posted to Moodle.

Notes **MUST** be taken. You may use IPADS, tablets and lap tops to takes notes of the power points only. The tests and exams will be taken on the computer in the classroom.

General Statements

- This document is subject to change. You will be notified in writing via email.
- There will be no phones in class. You are expected to take notes and ask questions.
- You are expected to arrive on time. Tardy arrival is professionally unacceptable. Late arrivals will be asked to leave for the day.
- Please be advised that the students has must arrive on time.

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- In the case of a serious situation, with proper documentation, you must take the assessment upon return. If the makeup is beyond 7 days of its original administration.
 - After 7 days
 - 7 days, the cap is 90%
 - 14 days, the cap is 80%
 - 21 days, the cap is 70% (an unacceptable score)