Course of Study and Syllabus for lecture

COURSE INFORMATION
Course Title: RAD 280-001
Semester: Summer 2014
Credits: 3
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 A. Mamatz, Jr., M.A.Ed., R.T. (R) (T)
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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:
- Identify the film’s contrast, latitude and speed using data from a characteristic curve.

**REQUIRED COURSE TEXTBOOKS**


**GRADING POLICY, COURSE REQUIREMENTS AND ASSIGNED GRADES**

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

- 45% Quizzes
- 35% Final Examination
- 20% Assignments
Policy Statement and Expectations

Students are expected to attend each lecture section and arrive on time. Two (2) points will be deducted from the final grade for late events after the first absence and late event for EACH subsequent event.

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.

Missed quizzes will not be made up.

Electronic Devices and Phones
The use of electronic devices- laptops, I phones, tablets etc is prohibited. Students will be afforded the PPT lectures. 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.
Image production and Evaluation constitutes 25% of the ARRT examination. Students MUST be versed and able to apply these principles into practice in competent, knowledgeable and safe manner. Between Image Production and Procedures, 55% of the ARRT exam consists of items in these two areas.

LEARNING MODULES, READINGS & ASSIGNMENTS

Unit 1: Film and Imaging Systems; conventional, CR and DR  
Wallace, Chapter 12

Unit 2: Automatic Processor  
Wallace, Chapter 12

Unit 3: Patients, mAs; reciprocity and anode heel effect  
Wallace, Chapter 5

Unit 4: kVp/ MAS relationship  
Wallace, Chapter 8

Unit 5: Distance; OID and SID  
Wallace, Chapter 6

Unit 6: Midterm Examination and Contrast  
Wallace, Chapter 7

Unit 7: Scatter Control; Grids  
Wallace, Chapters 9-10.

Unit 8: Recorded detail, resolution, spatial resolution  
Wallace, Chapter 11

Unit 9: Distortion; size and shape  
Wallace, Chapters 3 and 4
Unit 10: Technique Charts  
Wallace, Chapter 17

Unit 11: Technique calculations & Manipulation; course review  
Wallace, Chapter 18

Unit 12: Final Examination

General Statements

A. any student who is absent for 10% of this course is considered excessive and must withdraw or receive a failing grade. 10% of 45 hours is one course period.

B. brings text and a calculator to each class.

C. asks questions when prompted by faculty.

D. the policies and schedule published on this outline are subject to change.

E. Students are expected to actively participate in each class. Attendance alone does NOT constitute active participation. When you are studying, jot any of your questions down on a separate sheet of paper to address in class. That is an example of active involvement.