JEFFERSON COLLEGE

COURSE SYLLABUS

RAD176

Image Intensification and QA/QC

3 Credit Hours

Revised by: Janet E. Akers MET RT (R) (M)
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RADXXX Image Intensification & QA/QC

I.   CATALOGUE DESCRIPTION

      A.   Prerequisites: Acceptance to Radiologic Technology Program, Reading Proficiency

      B.   Credit hour award: 3

      C.   Description: This course provides the student w

          4. Filament circuit
- B. Image Intensification
  1. Basic Principles
  2. Purpose
  3. Advantages
  4. Historical perspectives
  5. Review of the anatomy and physiology of human eye

3. Tape recording
4. Cine recording

H.

3. Basic program setup
4. Categorizing repeats redud(z)-10(i)nt/3of   ( )Tj rpzeatc

i. Parallel
        ii. Focused
    6. SID importance with grids
        i. Focused
        ii. Parallel
    7. Grid alignment with central ray of x-ray beam
        i. Testing method
        ii. Results
        iii. Causes of grid misalignment
    8. Grid uniformity
        i. Testing method
        ii. Results
        iii. Causes of poor grid uniformity
R. X-ray timer testing
    1. Timer purpose
    2. Time and x-ray quantity
    3. Timer types
    4. Timer inaccuracy problems
    5. Rectification
        i. Single phase
        ii. Three phase
    6. Single –phase timer testing
        i. Manual spinning top
        ii. Motorized synchronous top
        iii. Oscilloscope
        iv. Dosimeter
    7. Three-phase timer testing
        i. Motorized synchronous top
        ii. Oscilloscope
        iii. Dosimeter
S. Reproducibility and linearity
    1. Miliamperage (mA), exposure and density
    2. Utilizing the high mA stations
    3. Inaccurate mA stations
    4. Evaluation of mA stations
    5. Reproducibility testing
        i. Definition
        ii. Testing methods
        iii. Results
    6. Linearity testing
        i. Definition
        ii. Testing methods
        iii. Results
T. Kilovoltage (kV)
    1. Function – kV accuracy
    2. Reasons for inaccuracy
    3. Testing methods

        4. Allowable limits
   U. Automatic Exposure Control (AEC)
        1. Exposure reproducibility
        2. Ion chamber sensitivity
        3. Image receptor (IR) exposure variation control accuracy
        4. Response capability
        5. Backup timer verification
   V. Lead apparel
   W. Fluoroscopy systems
        1. Exposure reproducibility
        2. Exposure rate
        3. Field size accuracy and beam alignment
        4. Source to skin distance limits
        5. Intensifier viewing system resolution
        6. Intensifier viewing system contrast
        7. Image display systems
        8. Automatic brightness control
    X. Picture Archiving and Communications System (PACS) QC
        1. Display monitor
             i. Purpose
            ii. Testing
           iii. Frequency
        2. Monthly/ quarterly performance
   Y. PACS continuous quality improvement (CQI)
        1. Recognition of non-diagnostic images
        2. System up-time
        3. System training
   Z. Digital radiography (DR) detector systems / automatic exposure controls (AEC)
        1. Vendor testing tools
        2. Purpose
        3. Tests
  AA. Digital Radiography Plate Reader
        1. Photostimulable storage phosphor (PSP)
        2. QC testing
        3. Frequency

IV.   METHOD(S) OF INSTRUCTION

This course is taught using a variety of instructional methods, which include but are not limited to interactive lectures, computer presentations, group activities and exercises, videos, supplemental handouts and student presentations. Students are expected to be *ACTIVE* participants in the learning process. Students are expected to read the assigned readings prior to scheduled class meetings and come to class

prepared to actively participate in all activities.

V.   REQUIRED TEXTBOOK(S)

Carlton, R. R., & Adler, A. M. (Current Edition). *Principles of Radiographic Imaging: An Art and Science.* Clifton Park, NY: Delmar, Cengage.

VI.   SUPPLEMENTAL TEXTBOOK(S)

Carter, C., & Veale, B. (Current Edition). *Digital Radiography and PACS.* St. Louis, MO: Mosby Elsevier.

Papp, J. (Current Edition). *Quality Management in the Imaging Sciences.* St. Louis, MO: Mosby Elsevier.

VII.   REQUIRED MATERIALS

A.   A computer with internet access and basic software to include Word and Power Point (available through Jefferson College labs)
B.   Course homepage available through Blackboard

VIII.   SUPPLEMENTAL REFERENCES

A.   Class Handouts
B.   Library Resources
        1. Textbooks
        2. Periodicals
        3. Films On Demand Videos
C.   Internet Resources
        1. On-line references
        2. Textbook companion website

IX.   METHOD OF EVALUATION (basis for determining course grade)

GRADES –Grades will be based on the percentage of total points earned out of total points possible for this semester. The assignments will vary in the number of possible points based upon amount of work involved and complexity of material. The student should be aware that proofreading and revision are extremely important when preparing homework. A final semester grade of 80% or above must be achieved in this course to successfully complete this course.

EXAMS –All exams with scores less than 75% must be retaken until a score of 75% or above is achieved to complete course requirements. The original score will be used to figure the semester grade. The student will be allowed to retake an exam a maximum of two times. If the student has not passed an exam within the three designated attempts, the student will present to the

Regular and punctual attendance is expected of all students. Any one of these four options may result in the student being removed from the class and an administrative withdrawal being processed: (1) Student fails to begin class; (2) Student ceases participation for at least two consecutive weeks; (3) Student misses 15 percent or more of the coursework; and/or (4) Student misses 15 percent or more of the course as defined by the instructor. Students earn their financial aid by regularly attending and actively participating in their coursework. If a student does not actively partici(4(i)--2(e)002 -1(eo(e)4(nt)-2 t)-2(s)-1(m)1-2(a)-6(h