Wharton County Junior College

Administrative Master Syllabus

Course Information

Course Title	Principles of Radiographic Imaging I
Course Prefix, Num. and Title	RADR 1313 Principles of Radiographic Imaging I
Division	Allied Health
Department	Radiologic Technology
Course Type	WECM Course
Course Catalog Description	Radiographic image quality and the effects of exposure variables. A minimum grade of "C" is required to pass this course.
Pre-Requisites	RADR 1409, 1411, and 1166 with a C or better.
Co-Requisites	None

Semester Credit Hours

Total Semester Credit Hours (SCH): Lecture Hours: Lab/Other Hours	3:2:4
Equated Pay Hours	4
Lab/Other Hours Breakdown: Lab Hours	4
Lab/Other Hours Breakdown: Clinical Hours	Enter Clinical Hours Here.
Lab/Other Hours Breakdown: Practicum Hours	Enter Practicum Hours Here.
Other Hours Breakdown	List Total Lab/Other Hours Here.

Approval Signatures

Title	Signature	Date
Prepared by:	Sharla Walker — Digitally signed by Sharla Walker DN: cn=Sharla Walker, o=WCJC, ou=Allied Heallth, email=sharlaw@wcjc.edu, c=US Date: 2020.04.27 14:29:10 -05'00'	04/27/2020
Department Head:	Sharla Walker — Digitally signed by Sharla Walker DN: cn=Sharla Walker, o=WCJC, ou=Allied Heallth, email=sharlaw@wcjc.edu, c=US Date: 2020.04.27 14:29:22 -05'00'	04/27/2020
Division Chair:	Carol Derkowski — Digitally signed by Carol Derkowski Date: 2020.04.27 16:03:31 -05'00'	4/27/2020
Dean/VPI:	Paul J. Quinn — Digitally signed by Paul J. Quinn Date: 2020.05.06 12:52:38 -05'00'	5/6/20
Approved by CIR:	Paul J. Quinn — Digitally signed by Paul J. Quinn Date: 2020.05.06 12:53:14 -05'00'	02/27/20

Additional Course Information

Topical Outline: Each offering of this course must include the following topics (be sure to include information regarding lab, practicum, and clinical or other non-lecture instruction).

I. Exposure Factors
   a. Distance
   b. mA
   c. Time
   d. Focal Spot
   e. kVp
   f. Grids
   g. AEC
   h. Beam Restriction
   i. Filtration

II. Receptor Exposure
   a. Factors that affect exposure receptors (anode-heel, OID, Patient Pathology)
   b. Receptor Exposure Calculations
      i. Reciprocity law
      ii. 15 percent rule
      iii. Grid Conversion
      iv. Direct Square/exposure maintenance

III. Differential Absorption
   a. Components
      i. Anatomy
      ii. Contrast Agents
      iii. Pathology
   b. Beam Quality
      i. kVp
      ii. Filtration
      iii. HVL

IV. Spatial Resolution
   a. Motion
      i. Part
      ii. Equipment
   b. Geometric
      i. Focal Spot
      ii. SID
      iii. OID
   c. Shape Distortion
      i. Foreshortening
   d. Elongation
      i. Tube/part/receptor relationship

V. Magnification
   a. Geometric factors
      i. SID
      ii. SOD
      iii. OID
   b. Display

VI. Beam Restriction
   a. Function/purpose

b. Types
c. Collimator components

VII. Beam Filtration
a. Types
i. Inherit
ii. Added
iii. Compensating
b. Function
c. Impact on image characteristics
d. Impact on HVL

VIII. Scatter Radiation
a. Prevention
i. Collimation
ii. kVp
b. Reduction
i. Grid
ii. Lead masking
iii. Air Gap(OID)
c. Effects
i. Image quality
ii. Patient Dose
iii. Occupational Exposure

IX. Grids
a. Function
b. Construction
c. Types
i. Focused
ii. Parallel
iii. Linear
iv. Crossed
v. Moving
vi. Stationary
vii. Short Dimension
viii. Long Dimension
d. Characteristics
i. Grid radius/focal range
ii. Ratio
iii. Frequency
iv. Grid Conversion factor
e. Selection
i. kVp
ii. Patient Exam
iii. Focal Range
iv. Alignment latitude
f. Primary cutoff

X. Exposure Factor Formulation
a. Purpose
i. Exposure standardization
ii. Patient exposure reduction
b. Technique Charts
i. Fixed kVp/variable mAs
ii. Variable kVp/ fixed mAs

c. Automated systems
    i. AEC
    ii. APR

XI. Image analysis/Image appearance standards
- a. Establishing appearance standards
    - i. Exam demands
    - ii. Visual acuity and perception
    - iii. Image viewing conditions
    - iv. Radiologists preferences and demands

XII. Imaging Standards
- a. Purpose
- b. Problem-Solving process
- c. Role of radiologic technologists
    - i. Determining cause of problems
    - ii. Corrective actions
    - iii. Establishing acceptable limits

XIII. Image Appearance Characteristics

XIV.
- a. Image identification
    - i. Patient info
    - ii. Date of exam
    - iii. Proper use of markers
    - iv. Institutional data
- b. Positioning
    - i. Anatomical considerations
    - ii. Positioning aids
- c. Exposure Indicator appropriateness
- d. Radiation Protection
    - i. Collimation
    - ii. Shielding
    - iii. Repeated images
- e. Patient Preparation
    - i. Contrast agents
    - ii. Pre-examination prep
- f. Artifacts
    - i. Patient related
    - ii. Equipment related
    - iii. Display monitor

XV. Corrective Actions
- a. Equipment malfunction
- b. Technical Factors
- c. Procedural Factors
- d. Artifacts

Course Learning Outcomes:

Learning Outcomes – Upon successful completion of this course, students will:

Apply the basic principles of radiographic image acquisition to image quality; and analyze the effects of exposure variables upon image quality.

Methods of Assessment:

Final written exam
Film Critique Sheets- Students will be asked to critique radiographic images in order to analyze the effects of exposure variables on image quality.

Required text(s), optional text(s) and/or materials to be supplied by the student:

Fauber, T, Radiographic Imaging and Exposure, Mosby, Publisher
Calculator

Suggested Course Maximum:

18

List any specific or physical requirements beyond a typical classroom required to teach the course.

The Radiology Classroom and Energized X-ray lab.

Course Requirements/Grading System: Describe any course specific requirements such as research papers or reading assignments and the generalized grading format for the course.

The course grade will be an average of the unit exams, lab assignments and a comprehensive final exam as follows: Unit Exams 75%, lab assignment grades will be averaged together and counted as one test grade, and final exam 25%.

100-92	A
91-83	B
82-75	C
74.9 and below	F

Curriculum Checklist:

☐**Administrative General Education Course** (from ACGM, but not in WCJC Core) – No additional documents needed.

☐**Administrative WCJC Core Course**. Attach the Core Curriculum Review Forms

- ☐Critical Thinking
- ☐Communication
- ☐Empirical & Quantitative Skills
- ☐Teamwork
- ☐Social Responsibility
- ☐Personal Responsibility

☒**WECM Course** -If needed, revise the Program SCANS Matrix and Competencies Checklist