Course Title - Radiographic Imaging Equipment
Course Prefix and Number - RADR 2309
Department - Radiologic Technology
Division - Allied Health
Course Type: (check one)

☐ Academic General Education Course (from ACGM – but not in WCJC Core)
☐ Academic WCJC Core Course
☒ WECM course (This course is a Special Topics or Unique Needs Course: Y or N)

Semester Credit Hours #: Lecture Hours #: Lab/Other Hours #: 3:2:4

EQUATED PAY HOURS FOR COURSE: 4

Course Catalog Description - Equipment and physics of x-ray production. Includes basic x-ray circuits. Also examines the relationship of conventional and digital equipment components to the imaging process.

Prerequisites/Co requisites - RADR 2305 and 1367 with a C or better.
I. Topical Outline – Each offering of this course must include the following topics (be sure to include information regarding lab, practicum, clinical or other non-lecture instruction):

1. Principles of Radiation Physics
   a. X-ray Production
   b. Target Interactions
   c. X-Ray Beam
      1. frequency and wavelength
      2. beam characteristics
         a. quality
         b. quantity
         c. primary vs. remnant
   3. Inverse Square Law
   4. fundamental properties

2. Imaging Equipment
   a. Components of Radiographic Unit (Fixed or Mobile)
      1. operating console
      2. x-ray tube construction
         a. electron sources
         b. target materials
         c. induction motor
   b. X-ray Generator, Transformers, and Rectification System
      1. basic principles
      2. phase, pulse, and frequency
   c. Components of Fluoroscopic Unit
      1. image intensifier
      2. viewing system
      3. recording systems
      4. automatic brightness control (ABS)
   d. Types of Units
      1. dedicated chest
      2. tomography unit
   e. Components of Digital Imaging (CR and DR)
      1. PSP
      2. Flat panel detectors
      3. start up and shut down
      4. CR plate erasure
      5. equipment cleanliness (plates , CR plates)
II. Course Learning Outcomes

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<th>Learning Outcome</th>
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<td>Upon successful completion of this course, students will:</td>
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<td>Differentiate between conventional and digital equipment; explain the physics of x-ray production; describe x-ray circuits; and relate conventional and digital equipment components to the image process.</td>
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<th>Methods of Assessment</th>
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<td>Final Course Exam</td>
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<td>Unit Exam- Ohms Law</td>
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<td>Group Assignment-Interactions</td>
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III. Required Text(s), Optional Text(s) and/or Materials to be supplied by Student.
Bushong, Stewart C., Radiologic Science for Technologists, the C.V. Mosby Company
Calculator

IV. Suggested Course Maximum -18

V. List any specific spatial or physical requirements beyond a typical classroom required to teach the course.
Radiology classroom and energized x-ray lab.

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

Each unit will end with a written exam. These exams will be averaged together and count as 75% of the final grade. There will also be a comprehensive final exam that will count as 25% of the final grade. These percentages are added together and a letter grade assigned based on the following scale:

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

VII. Curriculum Checklist

☐ Academic General Education Course (from ACGM – but not in WCJC Core)
   No additional documentation needed
☐ - Academic WCJC Core Course
   Attach the Core Curriculum Checklist, including the following:
   • Basic Intellectual Competencies
   • Perspectives
   • Exemplary Educational Objectives

☑ - WECM Courses
   If needed, revise the Program SCANS Matrix & Competencies Checklist.