COURSE INFORMATION FORM

DISCIPLINE Radiologic Technology
COURSE TITLE Radiation Physics
CR.HR 3.0 LECT HR. 2.5 LAB HR. 1.0 CLIN/INTERN HR. ______ CLOCK HR. ______

CATALOG DESCRIPTION
Application of fundamental physics principles relating to energy, electricity, magnetism and their relevance to the study of x-ray equipment.

PREREQUISITES
RATE 180, RATE 270, RATE 279, RATE 285 with a grade of C or better and concurrent enrollment in RATE 283

EXPECTED STUDENT OUTCOMES IN THE COURSE (ESO)
Upon completion of this course, the student will be able to:
1. Utilize basic algebraic principles to employ formulas to solve for unknown variables in radiographic imaging systems.
2. Synthesize the concepts of radiation concepts, electrostatics, electrodynamics, magnetism and electromagnetism.
3. Synthesize the operation of rectifiers, transformers, motors and generators.
4. Compare and contrast various types of radiographic equipment.
5. Draw various types of x-ray circuits and explain their operation.
6. Diagram an x-ray tube and discuss its operation.
7. Synthesize the purpose, principles and application of automatic exposure control, conventional tomography and fluoroscopy.
8. Employ QM procedures to create a QM program, perform the necessary procedures and assess the data.
10. Compare and contrast x-ray quantity.

GENERAL EDUCATION OUTCOMES (ESO)
Specify which general education outcomes, if any, are substantially addressed by the course. Numbers in parentheses identify the Expected Student Outcomes linked to the specific General Education Outcome.

Outcomes ESO
PROGRAM-LEVEL OUTCOMES

CAREER AND TECHNICAL EDUCATION PROGRAM OUTCOMES
Specify which Career and Technical program outcomes, if any, are substantially addressed by the course by completing the “Career and Technical Education template” to show the relationship between course and program outcomes to assessment measures.

- Be workforce ready, demonstrating competence in the entry level skills of the profession
- Communicate effectively and appropriately
- Think critically and apply problem solving skills

CLASS-LEVEL ASSESSMENT MEASURES
Student accomplishment of expected student outcomes will be assessed using the following measures. (Identify which measures are used to assess which outcomes.)

1. Written examinations (1, 2, 3, 4, 5, 6, 7, 8, 9, 10)
2. Laboratory experiments and activities (1, 2, 3, 4, 5, 6, 7, 8, 9, 10)
3. Workbook exercises (1, 2, 3, 4, 5, 6, 7, 8, 9, 10)
4. Classroom discussions (1, 2, 3, 4, 5, 6, 7, 8, 9, 10)
5. Oral presentations (1, 2, 3, 4, 5, 6, 7, 8, 9, 10)
Individual instructors may order this outline as fits the needs of their individual courses. In addition, they may place more emphasis on some areas than on others. What is assured is that this particular list is covered in the course. Other topics may be added to a course as the instructor sees fit, and as time and interest allow. An *asterisk can be used to mark an item as optional.

I. Basic Algebra Review
II. Units of Measurement
III. Radiation Concepts
   A. Atomic Theory
   B. Energy
   C. Electromagnetic Spectrum
IV. Electricity
   A. Electrostatics
   B. Electrodynamics
V. Magnetism and Electromagnetism
VI. Motors and Generators
   A. Purpose
   B. Components
   C. Principles
   D. Applications
VII. Transformers
   A. Purpose
   B. Principles
   C. Types
   D. Waveforms
VIII. Rectification
   A. Purpose
   B. Principles
   C. Types
   D. Waveforms
IX. X-Ray Equipment and Circuits
   A. Types
   B. Features
   C. Power Supply
   D. X-Ray Circuitry
X. X-Ray Tubes
   A. Components
   B. Operation
   C. Tube Life
XI. Production Of X-Rays
XII. Emission Spectrum
XIII. AEC
   A. History
   B. Purpose
C. Detectors
D. Principles
E. Applications

XIV. Tomography
A. Purpose
B. Principles
C. Equipment
D. Applications

XV. Fluoroscopy
A. Purpose
B. Principles
C. Equipment
D. Applications

XVI. Quality management
A. QC
B. QA