

**Science Division  
Course Outcomes Assessment  
FY 13**

**Course Title: PHY 106 – Radiological Physics Theory**

**Program Team: Brenda Hassinger and Jennifer Beirdneau**

**Expected Learning Outcomes:**

- Identify and use metric units, logarithms and scientific notation to perform calculations,
- Use appropriate mathematical equations for work, force, inertia, energy, momentum and power,
- Analyze basic DC parallel and series circuits,
- Identify atomic structure and subparticles of matter, atoms, and elements,
- Utilize the principles of stationary charges, electrostatics, laws of magnetism, and electromagnetism,
- Identify anatomy and properties of DC and AC generators, motors and transformers,
- Calculate step-up and step-down voltages and currents for transformer ratios,
- Describe production of high voltage, rectification, thermionic emission, and solid state diodes,
- Identify the principles of x-ray production and properties of x-rays, electromagnetic radiations and the interactions of x-rays with matter,
- Graph on semilog paper and determine the value of half-value layer filtration,
- Graph and analyze saturation current for various tube voltages and currents,
- Identify the various types and designs of X-ray tubes, fluoroscopic tubes,
- Read and interpret x-ray technique charts, tube cooling curves,
- Diagram complete X-ray circuits for single phase, three phase, and high frequency generator, and fluoroscopy equipment.

**Assessment** (How do or will students demonstrate achievement of each outcome?)

four examinations\* and a comprehensive final

\*Each of the four examinations included points accrued for successful completion of laboratory and problem-solving activities.

**Validation** (What methods have you used or will you use to validate your assessment?)

Students passing with a 75% or better

97% (28/29 students) successfully completed the course.

**Results** (What do your assessment data show? If you have not yet assessed student achievement of your learning outcomes, when is assessment planned?)

We provided tutoring sessions and developed supplemental worksheets based on student performance. 1 student did not successfully pass the course. This student did not take advantage of the tutoring sessions and upon finishing the semester she is looking to change her major and not return to the radiography program.

Achieve a passing scaled score (75 or higher) on the American Registry of Radiologic Technologists (ARRT) national certification examination upon graduation.

**Follow-up** (How have you used or how will you use the data to improve student learning?)

Plan to integrate tutoring sessions and worksheets into future classes.

**Budget Justification** (What resources are necessary to improve student learning?)

No additional resources needed.