Science Division
Course Outcomes Assessment
Spring 2018

Course Title: PHY 106 – Radiological Physics Theory

Instructor: Michelle McDaniel

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, electrodynamics, laws if 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?)
Exams, quizzes, homework assignments, comprehensive final exam.

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

Students will pass course with a 75% or better.
85% of students will correctly answer designated questions on final exam.

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

100% passed class with a minimum of 75% (31/31 students)

We provided one tutoring sessions and developed supplemental worksheets based on student performance.

Designated Questions:

Question number from Exam	Actual Results (# correct)	% Correct
Final #1 X-ray Circuit	29/31	94%
Final # 2 Brems interaction	31/31	100%
Final # 3 Operational Guidelines	23/31	74%
Final #4 Characteristic interaction	27/31	87%
Final # 5 Incoming line current	26/31	84%
Final # 6 Three-phase unit	9/31	29%
Final # 7 Terminate Exposure	20/31	65%
Final # 8 AEC unit	25/31	81%
Final # 9 overload	29/31	94%
Midterm # 20 Magnetic field	31/31	100%
Midterm # 28 Electromagnetic energy	30/31	97%
Midterm # 56 Ionization	30/31	97%
Midterm # 64 Isotopes	31/31	100%
Midterm # 66 Resistance	29/31	94%
Midterm # 85 Wave equation	28/31	90%

Follow-up (How have you used or how will you use the data to improve student learning?) Five of the questions scored less than the 85%. Elaborate on and provide more examples of the AEC unit and terminating the exposure. Add an activity that shows components of three-phase equipment. Discuss the importance of operational guidelines.

Budget Justification (What resources are necessary to improve student learning?)
No additional resources needed.