

**Science Division
Course Outcomes Assessment
Spring 2014**

Course Title: PHY 106 – Radiological Physics Theory

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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?)

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?

96% passed class with a minimum of 75% (24/25 students)

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 will be eligible to apply for reentry to the program in fall 2014.

Designated Questions:

Outcome #2 Competently perform routine imaging procedures.	Question number from Final Exam	Actual Results (# correct)	% Correct
	#1 X-ray Circuit	25/25	100%
	#2 Image Intensification Tube	11/25	44%
	# 3 Grid	23/25	92%
	# 4 Light Photons	14/25	56%
	# 8 Operational Guidelines	21/25	84%

Outcome # 3 Utilize appropriate protection and standard precautions	Question number from Final Exam	Actual Results (# correct)	% Correct
	# 17 AEC unit	10/25	40%
	# 18 Terminate Exposure	15/25	60%
	# 20 Dead-man Switch	22/25	88%
	# 23 Timer 3 phase unit	20/25	80%

Question #2 and # 4: Ensure review of the fluoro unit. This is a new concept for the students at this point so look at implementing a worksheet where they need to label the different parts of the fluoro unit as well as listing the function for each part.

Question # 17 and # 18: Review AEC and the function due to this concept being taught in a previous semester it would be good to do a complete review.

Question # 23: When discussing the circuit make sure to review the timer for the three phase unit.

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

Continue to keep course offered as two sessions which is allowing for smaller class size. Continue to have homework and assignments that students utilize the LSC for math tutoring. Also continue to offer physics tutoring for difficult concepts.

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

No additional resources needed.