Hagerstown Community College
Health Sciences
Radiography Program

COURSE: PHY 106 -02– Radiological Physics Theory CREDITS: 3

INSTRUCTOR: Michelle McDaniel & Donna Carroll SEMESTER/YEAR: Spring 2016

COURSE DESCRIPTION: This course is required for students enrolled in the Radiography course. It includes the basic laws and principles of physics necessary for understanding the production of x-rays and radiation protection.

TEXTBOOK:

Principles of Radiologic Imaging (5th edition), Carlton and Adler

ADDITIONAL TEXTBOOK RESOURCES:

Radiological Science for Student Technologists (9th edition), Stuart C. Bushong

STUDENT LEARNING OUTCOMES:

After completing this course, the student will be able to define and apply the following Physics concepts to radiography practice:

- Use of metric units, logarithms and scientific notation,
- Physics of work, inertia, energy, momentum and power,
- Structure of matter, atoms, and elements,
- Electrostatics, electrodynamics, magnetism, and electromagnetism,
- DC and AC generators, motors and transformers,
- Calculation step-up and step-down voltages and currents for transformer ratios,
- Production of high voltage, rectification, thermionic emission, and solid state diodes,
- Production and properties of x-rays, electromagnetic radiations and the interactions with matter,
- Half-value layer filtration and saturation current,
- X-ray tubes, fluoroscopic tubes, x-ray technique charts, tube cooling curves, and beam limiting devices,
- X-ray circuits, single phase, three phase and high-frequency generators and fluoroscopy equipment.

ACCOUNTING FOR CREDIT HOUR REQUIREMENT:

PHY 106 Radiation Physics Face- to-face class

Assignment/Assessment	Clock Hours
Reading/studying for lecture exams	5 exams X 20 hours per exam =100
Reading/studying chapter material	8 Chapters X 1 hour per chapter = 8

One midterm assessment (Chapters 1-4)	1 exam X 10 hours = 10
One final assessment (Chapter 6-7, and 12)	1 exam X 10 hours = 10
Homework/math problems	20 hours completing homework/math problems
Total out of class time	**148 hours**

TOTAL HOURS OF COURSEWORK:

To earn one academic credit at HCC, students are required to complete a minimum of 37.5 clock hours (45 fifty-minute "academic" hours) of coursework per semester. Those hours of coursework may be completed through a combination of hours within the classroom and hours outside the classroom. Certain courses may require more than the 37.5 minimum hours of coursework per credit.

For most classes, students should expect to do at least 2 hours of coursework outside of class for each hour of in-class coursework.