MI 132 – Imaging Principles and Equipment
Class Preparation Assignment #2
Unit 1 – Electromagnetic Radiation

Due: Tuesday 8/30/2022
Textbook Chapter 3 (p. 26-33)
Objectives:

1. *List and define the four common characteristics of all waves.*
2. *Explain the relationship between energy, wavelength and frequency.*
3. *Describe wavelength and frequency and how they are related to velocity.*
4. *Differentiate between the radiations along the electromagnetic spectrum in reference to energy, frequency and wavelength.*
5. *Explain the wave-particle duality theory.*
6. *Differentiate between ionizing and non-ionizing radiation.*

Questions:

1. According to James Maxwell's electromagnetic theory, what three things do all types of electromagnetic radiation have in common?

2. Define and describe the four common characteristics of all waves – wavelength, velocity, amplitude and frequency.

3. Explain the relationship that exists between wavelength and frequency. What formula is used to describe the relationship between wavelength and frequency?

4. What formula is used to describe the relationship between frequency and energy? What type of relationship exists between frequency and energy?

5. List the members of the electromagnetic spectrum in order of lowest to highest energy.

6. Identify the portions of the electromagnetic spectrum that can ionize matter. Why?

7. Explain the wave-particle duality theory and what influences how the different members of the electromagnetic spectrum interact.

8. Identify the difference between x-rays and gamma rays.