

Study Guide (Final)

The content covered in Study Guide 1, 2 and 3. (45%)

Circuitry (15%)

Covered in Labs. Including: Ohms Law, analyze of DC circuit.

Optics: (40%)

1. Geometric Optics

a. Rays:

What are they? How do we draw rays to represent the intensity, direction of light, wavefront surfaces.

b. Mirrors:

- What is the difference between plane, concave and convex mirror?
- Law of reflection
- How do we using ray tracing to find the image in a mirror?

c. Refraction and lenses:

- What is refraction? What is index of refraction (refractive index)?
- What is Snell's law and how do we use it?
- What are lenses? What types could a lens be? How do we do ray-tracing for the lenses?
- What is thin lens equation? What are the signs of each term in the equation? How do we use it?

2. Wave-nature of Light

- What is a wave? What's the relationship between the direction of wave propagation and the motion of individual points on a wave?
- What is wave equation? Understanding the wave nature of of light from Maxwell equations.
- What are frequency, period, amplitude and polarization of a wave?
- What are the relation between wavelength, frequency, and wave speed?
- What is interference, diffraction phenomenon?
- What is the quantitative relation between the spacing of interference patterns and the size of opening, wavelength?
- Possible applications?