Learning Unit 5 Introduction

Shadows, holograms, interference, and diffraction are optical phenomena that are tough to explain using ray theory. That is where Christian Huygens, for one, used the Wave theory of light to help understand why our shadows are fuzzy, and why light turns the corner when no mirror is present.

Recently called Physical optics, wave theory or wave optics are key principles required for technicians or engineers to bridge together optical systems and their performance.

Waves and wave propagation through or near different material or media can be precisely predicted with a good understanding of what a wavefront is and how it moves. In so doing, the phenomena of interference, diffraction, and polarization may be studied.

The study of these phenomena creates the basis for an understanding of such optical devices and concepts as holograms, interferometers, thin–film interference, antireflection (AR) and high reflection (HR) coatings, diffraction gratings, linear, circular, and elliptical polarizers, quarter–wave plates, and laser beam intensity patterns, both in the near and far field.