Geometrical optics 800 (GMO 800)

Qualification	Postgraduate
Faculty	Faculty of Natural and Agricultural Sciences
Module credits	36.00
NQF Level	09
Programmes	MMed (Ophthalmology)
Prerequisites	No prerequisites.
Contact time	1 lecture per week
Language of tuition	Module is presented in English
Department	Physics
Period of presentation	Year

Module content

Mathematical description of waves; Light as an electromagnetic wave; Nature of sources of light; Wave fronts (Huygens principle); Snell's Law; Index of refraction; Exploration of the laws of reflection and refraction at planar and curved surfaces; Ray tracing methodology to find position, Nature of images and magnification; Thin lens formula; Conjugate foci formula; Lensmaker's formula; Ophthalmic prisms: characteristics, classification and refractive power; Thin lenses: types, image formation; Cylindrical lenses: Introduction; Optical Systems: Lens combinations (notation, toric lenses); Thick lenses (cardinal points, system power); The Eye: structure and function, reduced eye; Aberrations in general; Eye defects: myopia, hyperopia, presbyopia, astigmatism; Optical apparatus for ophthalmology: invasive / non-invasive, ophthalmic laser, ophthalmoscope, fundus camera, light coagulator.