# University of Pretoria Yearbook 2018

# Geometrical optics 800 (GMO 800)

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| **Qualification** | Postgraduate |
| **Faculty** | Faculty of Natural and Agricultural Sciences |
| **Module credits** | 36.00 |
| **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.