

**Title of module: Visual Optics, psychophysics and applications**

**Lecture hours: 13 x 2 = 26 hours (1.0 Module)**

**Practical hours: 8 x 3 = 24**

**Person in charge: Dr Sotiris Plainis - Prof. MiltiadisTsilimbaris**

1. Diffraction – Interferometry (lecture 2 hrs, practical 3 hrs)
2. Ocular refraction (refractive error – myopia, hypermetropia, astigmatism, prevalence, aetiology, myopia control) (lecture 2 hrs, practical 3 hrs)
3. Visual resolution (lecture 2 hrs)
  - Limits of visual resolution (diffraction, aberrations, scatter, physiological factors, cone spacing)
  - Evaluating visual resolution – visual acuity - standards
  - VA Charts for distance and near vision – standardised practice
  - sudden loss of visual acuity
4. Ophthalmic lenses (lecture 2 hrs, practical 3 hrs)
5. Contact Lenses (lecture 2 hrs)
6. Direct and indirect Ophthalmoscopy (lecture 2 hrs, practical 3 hrs)
7. Confocal microscope (Imaging the cornea) (lecture 2 hrs, practical 3 hrs)
8. Introduction to Visual Psychophysics (lecture 2 hrs)
  - psychophysical methodology
  - psychometric function
  - defining threshold,
  - laws of vision
9. Contrast Sensitivity (lecture 2 hrs, practical 3 hrs)
  - definition
  - methodology – using simplex and compound gratings
  - Fourier analysis,
  - spatial, temporal and chromatic CSF
  - links to neurophysiology
  - contrast adaptation
10. Visual fields – perimetry (lecture 2 hrs, practical 3 hrs)
11. Low vision (lecture 2 hrs)
12. Tonometry – Ocular Rigidity (lecture 2 hrs, practical 3 hrs)
13. Binocular Vision and Stereopsis (lecture 2 hrs)

The module will cover a range of lectures on visual optics and visual psychophysics with applications on current diagnostic techniques and visual instrumentation. The module is supported by eight labs (practical work in ophthalmic lenses, evaluating visual acuity, keratometry, defocus and VA, confocal microscopy, contrast sensitivity, tonometry - and a clinical demonstration of visual fields and Direct and Indirect Ophthalmoscopy)

Assessment method: 3 hr written examination at the end of semester + reports.