Level: Vocational studies of OPTOMETRY

Course title: Physiological Optics

Status: obligatory

ECTS: 6

Requirements: Anatomy and Physiology of the Eye

Learning objectives:

This module aims to provide students with:

1. Knowledge of the behaviour of light in relation to the eye
2. An understanding of the basic concepts of visual processing, with emphasis on the scientific methods used in its exploration
3. An understanding of neurophysiological processing within the visual system by presenting the normal features of colour vision and introduces the basis of abnormalities
4. Understanding the physiological basis of visual acuity and ability to evaluate critically methods used in its measurement
5. An understanding of the contrast sensitiviy and the physiological basis of contrast sensitiviy at the retinal and cortical level

Learning outcomes:

The overall competence is acquiring knowledge and students' ability for individual and team scientific research work in the field of applying physical concepts to the visual perception. The specific competences are, for example:

Knowledge and Understanding:

- Working knowledge of the concept of threshold, its physiological basis and measurement
- Knowledge of visual performance under different lighting conditions and ability to interpret the influence of experimental parameters
- Ability to discuss the physiological basis for suprathreshold performance in judging brightness and size
- Ability to interpret some visual illusions and appreciation of what illusions can teach us about the visual system
- Ability to describe the classical theories of colour vision
- Ability to distinguish between the different forms of colour defects and evaluate tests of colour vision

Skills:

- An ability to demonstrate skills associated with the use of selected optometric equipment.

The intellectual skills associated with the assimilation of educational subject matter; preparation of notes, revision material, the ability to access and utilise information from a variety of sources

Syllabus:

Theoretical instruction

This module provides the student with a basic understanding of light in relation to the eye and the formation of the retinal image. This module provides information on the physiological processes of human vision. The subject areas include retinal processes, visual acuity, contrast sensitivity and vision at different light levels. Limits of vision are investigated in relation to spatial and temporal performance. Theory and practical aspects of assessing normal and abnormal colour vision is included in this module.

Practical instruction

Lab exercises on Biopac Student Lab System

Literature:

1. Steven H. Schwartz, Visual Perception: A Clinical Orientation, McGraw-Hill, 2004.
2. Steven H. Schwartz, Geometrical and Visual Optics: A Clinical Introduction, McGraw-Hill, 2013.
3. Southall, J. P. C.: Introduction to Physiological Optics, Dover Publications, inc., New York, 1937, 1961.

Weekly teaching load				Other:
Lectures: 3	Exercises: 2	Other forms of teaching:	Student research:	