UNIVERSITY of BRADFORD

Module Descriptor

Module Details	
Module Title	Vision, Optics and Refractive Correction 1
Module Code	OPT4018-V
Academic Year	2024/5
Credits	50
School	Life Sciences (Faculty-wide)
FHEQ Level	FHEQ Level 4

Contact Hours	
Type	Hours
Independent Study	296
Laboratories	72
Seminars	36

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Academic Year

Module Aims

To develop an understanding of the optics of the eye and optical systems. To develop an understanding of basic optical appliances and the skills needed to dispense such appliances. To develop an understanding of visual perception and psychophysical principles relevant to clinical optometry. To provide students with a fundamental understanding of the principles underlying refraction and associated visual assessment. To develop an understanding of the effect of ametropia on unaided vision at distance, near and intermediate viewing distances, and to understand how this interacts with patient age and accommodation. To develop the basic clinical skills needed for objective and subjective refraction and visual acuity assessment.

Outline Syllabus

Ametropia and optics:
Classification and symptoms
Causes/types of refractive error
The model eye
Vergence and the dioptre
Prevalence of refractive error
Development of refractive error
Optics of the eye and simple optical systems

Assessment of refractive error:
Measurement of interpupillary distance and trial-frame fitting
Visual acuity measurement
Objective determination of refractive error (retinoscopy, auto refractors)
Subjective determination of refractive error
Measurement uncertainty/repeatability and chart design for visual acuity measurement
Phoropters vs trial frames
Near refraction, near acuity and near vision adequacy
Prescribing refractive correction

Accommodation and presbyopia:
Influence of accommodation and age on unaided vision, and the range of clear vision
Effects of different types of refractive error on unaided vision and the range of unaided vision found in eyes with similar refractive errors

Optical systems and appliances:
Optics of thick lenses
Light as a wave, aberrations and wavefronts
Hand neutralisation and focimetry
Lens form, surface power, sag, lens measure and lens thickness
Optics of multi-lens systems
Ophthalmic prisms
Ophthalmic lens materials
Spectacle frame description, materials and measurements
Astigmatic decomposition
Back vertex distance effects, field of view and lens tilt effects
Prescription analysis
Vertical lens centration measurements
Lens tints and treatments

Visual perception & psychophysics:
Limits of vision, detection and discrimination
Psychometric functions, thresholds and thresholding methods

Learning Outcomes	
Outcome Number	Description
01	Apply the relevant visual optics theory to describe and explain emmetropia and ametropia
02	Recount the principles underlying retinoscopy, subjective refraction and visual acuity determination
03	Accurately carry out retinoscopy, subjective refraction and measurement of visual acuity
04	Recognise and explain the impact of uncorrected ametropia on vision at distance and near, and the associated influences of age/accommodation.
05	Analyse patient requirements in ophthalmic lens dispensing and apply knowledge of ophthalmic lenses to select appropriate appliances for patients.
06	Perform accurate measurements of optical appliances and analyse the results to make appropriate professional decisions.
07	Demonstrate an ability to handle data accurately and confidently.

Learning, Teaching and Assessment Strategy

This module uses a range of approaches to presentation of module content including lectures, prepared written materials, interactive tutorials and practical clinical sessions, supported by online multimedia material and directed study. Practical clinical sessions are used to develop basic skills in fundamental clinical techniques.

This module is assessed by a written exam, a reflective logbook of experience in practical clinical sessions and practical station assessments on clinical techniques.

The practical assessment is a MUST PASS assessment and students must pass this in order to pass the module.

Mode of Assessment			
Type	Method	Description	Weighting
Summative	Computerised examination	Closed-book unseen computerised examination	70%
Summative	Coursework - Written	Lab Logbook	10%
Summative	Examination - practical/laboratory	Practical assessments (MUST pass at 40%)	20%
Formative	Other form of assessment	Formative written exam	N/A
Formative	Other form of assessment	Formative practical assessments	N/A

Reading List

To access the reading list for this module, please visit https://bradford.rl.talis.com/index.html

Please note:
This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.

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