

Optometry and vision sciences

Vision sciences and optics

The Department of Optometry and Vision Sciences provides a series of subjects in vision and optical science to BSc students that will lead to a major in vision sciences. Vision science is the study of the eye, vision and optics. There are 10 visual sciences subjects, all aiming to provide students with a thorough knowledge of the eye and visual performance together with an understanding of the physiological processes underlying vision. The three subjects in optical science aim to provide an understanding of optical systems and the ability to analyse the performance of optical systems, as well as the ability to develop designs for optical systems to specified performance criteria.

The subjects available to BSc students are:

- 655-102 Optical Systems (*p.1*)
- 655-111 Vision: How The Eye Sees The World (*p.1*)
- 655-210 Optical Design and Ophthalmic Metrology (*p.1*)
- 655-211 Ocular Anatomy & Histology (*p.2*)
- 655-221 Human Visual Functions (*p.2*)
- 655-222 Visual Processing and Control (*p.2*)
- 655-321 Visual Physiology and Perception (*p.2*)
- 655-331 Image Capture, Processing and Display (*p.2*)
- 655-351 Ophthalmic Prosthetics I (*p.3*)
- 655-028 Foundations of Visual Neuroscience (*p.2*)
- 600-312 Research Project B (*p.1*)

All the subjects are 12.5 points.

BSc students who have completed the recommended subjects in visual and optical sciences and gain entry into the Bachelor of Optometry course may be given credit for the equivalent subjects within the optometry degree. Successful applicants, providing their previous subjects taken are equivalent to the first year of the optometry course, would be entering into the second year of the course. BSc(Hons) degree students who have passes in the BSc optics and vision science subjects offered, may qualify for entry into the third year of the optometry course.

Bachelor of Optometry

The Department of Optometry and Vision Sciences is responsible for the five-year course leading to the degree Bachelor of Optometry. Optometry is a professional discipline based on the optical and visual sciences. The practice of optometry involves the diagnosis and treatment of functional disorders and diseases of the eye and vision: the optometrist's job is to solve patients' visual problems. The full list of subjects in the Bachelor of Optometry course is given on page 29.

Bachelor of Science (Honours)

For information about the faculty and departmental requirements for honours, please refer to *Bachelor of Science (Honours) and Bachelor of Information Systems (Honours) (p.1)*. These requirements should be considered when planning your course.

Further information

Department of Optometry and Vision Sciences
The University of Melbourne
Cnr Keppel and Cardigan Streets
Carlton 3053
Tel: +61 3 9349 7408
Fax: +61 3 9349 7498
Web: <http://www.optometry.unimelb.edu.au>

Optometry and vision sciences subject descriptions

The following subjects are available to BSc, BAsC and BSc-combined degree students.

100-level subjects

655-102 Optical Systems

Note: Credit cannot be granted for both this subject and 655-202 (or 655-101 offered prior to 2003).

Credit points: 12.5

HECS-band: 2

Coordinator: Assoc Prof G Smith

Contact: Thirty-six lectures (three per week), 12 tutorials, 36 hours practical work and computer assisted learning (*Semester 2*).

Description: The topics to be covered are image formation by simple lenses, mirrors, prisms and complex optical systems, along with associated phenomena such as paraxial optics, aberration theory, image quality, diffraction, interference, polarisation and thin films. This basic knowledge will be applied to particular common visual instruments such as microscopes, telescopes and the human eye.

At the end of the subject, the student should understand how images are formed by simple lenses and more complex optical systems (in particular the eye) and the factors that affect the nature and quality of these images. In particular, given the structure of a system, students should, by using basic ray tracing rules, be able to predict the position and size of the image.

The material covered in this subject involves trigonometry, geometry and the analysis of two- and three-dimensional diagrams. Therefore at the end of the subject, students should have enhanced skills in basic mathematics and in dealing with two- and three-dimensional spatial relationships.

This subject should also allow students to develop the following generic skills:

- critical thinking through problem solving;
- efficient time management in completing assignments; and
- cooperation and teamwork through laboratory work.

Assessment: A 3-hour written examination at the end of the semester (70%); weekly tests associated with the practical classes and an assessment of practical work (30%). A pass must be obtained for the practical work.

Prescribed texts: G Smith and D A Atchison, *The Eye and Visual Optical Instruments*, Cambridge University Press, 1997.

655-111 Vision: How The Eye Sees The World

Credit points: 12.5

HECS-band: 2

Coordinator: Dr A Metha; Dr M Pianta

Contact: Thirty lectures and 18 hours of practical and computer assisted learning sessions (*Semester 1*).

Description: This subject aims to provide a primary understanding of basic vision functions and visual perception. Topics to be covered include light, its measurement and quantification, the transmission characteristics of the eye and perceptual attributes; basic anatomy of the eye and visual pathways as they relate to visual perception and refractive error (near-sightedness, far-sightedness and astigmatism); detailed anatomy of the orbit, and orbital contents, including the extra-ocular muscles and their actions; comparative anatomy and physiology discussing how human eyes are at the same time both similar and dissimilar to those of other species with regard to general structure, colour vision, visual acuity and accommodation; experimental approaches used to measure sensory modalities; fundamental attributes of our monocular processes such as: the perception of colour, temporal (flicker) vision, form (spatial) vision and the space sense; and basic binocular function including the perception of depth and stereopsis. You will learn what '20/20 vision' means and why we perceive depth with the 'magic eye' pictures. Congenital and acquired visual anomalies will be used throughout the course to illustrate visual dysfunction.

Assessment: A 2-hour written examination at the end of semester (comprising a combination of multiple choice and written answers). Practical work will comprise 15% of the total mark.

Prescribed texts: S H Schwartz, *Visual Perception: A Clinical Orientation*, 2nd edn, Appelton and Lange, 1994.

200-level subjects

655-210 Optical Design and Ophthalmic Metrology

Credit points: 12.5

HECS-band: 2

Coordinator: Assoc Prof G Smith; Dr A Metha

Prerequisites: 655-101 Optical Systems or 655-102 Optical Systems (*p.1*)

Contact: Thirty-six lectures (three per week), 24 hours practical work including assignments on optical design. There will also be assignments on ophthalmic lens calculations to complete during the semester (*Semester 2*).

Description: The purpose of this subject is to provide an understanding of the principles and techniques of optical design including an understanding of the control and optimisation of aberrations. It is an introduction to ophthalmic lenses and spectacle lens design. The topics covered include aberration theory, optical design and control of aberrations including the design of ophthalmic lenses, advanced photometry and radiometry, and optics of commonly used ophthalmic instruments. Practical classes will include computer-aided tutorials on both optical design and lens calculations.

Assessment: A 3-hour written examination at the end of the semester (80%). Assessment of practical work and assignments (20%). A pass must be obtained for both the written and practical work.

Prescribed texts: G Smith and D A Atchison, *The Eye and Visual Optical Instruments*, Cambridge University Press, 1997. • M Jalie, *The Principles of Ophthalmic Lenses*, 4th edn, Assoc Brit Disp Opticians, 1984. • D B Henson, *Optometric Instrumentation*, 2nd edn, Butterworths, 1996. An additional reference list will be provided.

655-211 Ocular Anatomy & Histology

Credit points: 12.5

HECS-band: 2

Coordinator: Dr E L Fletcher

Prerequisites: Biology 600-141 and 600-142

Contact: Thirty lectures (three per week), 24 hours of practical and tutorial classes (*Semester 1*).

Description: This subject covers the detailed anatomy and histology of the eye, orbit and visual pathways. Upon completion of this subject students should comprehend the terminology of histology and cytology; be able to identify and interpret the light and electron microscopic appearance of cells and tissues; the histology of the eye, orbit and visual pathways; the embryological development of the eye; the neuroanatomy of the visual pathways. A series of lectures will give an introduction to histology and will be supplemented by practical work on examination of histological preparations. Detailed topographic anatomy of the orbit, eye and visual pathway, including the extra-ocular muscles and their actions will be studied. A further series of lectures will be given on the histology and detailed ultrastructural anatomy of the eye, orbit and visual pathways with associated practical classes.

Assessment: A 2-hour written examination (80%) and assessment of practical work (20%).

Prescribed texts: A J Bron, R C Tripathi and B J Tripathi, *Wolff's Anatomy of the Eye and Orbit*, 8th edn, Chapman and Hall, 1997.

655-221 Human Visual Functions

Credit points: 12.5

HECS-band: 2

Coordinator: Assoc Prof T Vidyasagar

Prerequisites: 655-111 Vision: How The Eye Sees The World (*p.1*). A 100-level mathematics subject is recommended, but not a prerequisite.

Contact: Twenty-four lectures (two per week), 36 hours practical work (three hours per week) and computer-assisted learning (*Semester 1*).

Description: This subject gives a detailed account of the capabilities of the human visual system and an introduction to theories of visual function. Experience is gained in the laboratory classes in measuring visual functions and in using classical visual psychophysical methodology. The topics covered are the specification of the visual stimulus, the light sense including spectral luminous efficiency, light and dark adaptation and increment thresholds; temporal resolution and critical fusion frequency; the form sense including visual acuity and the contrast sensitivity function, the colour sense and theories of colour vision, the visual space sense, including binocular correspondence, the horopter, fusion and stereopsis.

Assessment: A 3-hour written examination at the end of the semester (85%). Practical work (15%). A pass must be obtained for the practical work.

Prescribed texts: Students are reminded that it will be necessary to read sources other than these textbooks. References to texts and journal articles will be given during the lectures and students will need to consult these sources.

W M Hart (ed.), *Adler's Physiology of the Eye, Clinical Applications*, 9th edn, Mosby, 1992. • S H Schwartz, *Visual Perception: A Clinical Orientation*, 2nd edn, Appleton and Lange, 1994.

655-222 Visual Processing and Control

Credit points: 12.5

HECS-band: 2

Coordinator: A/Prof T Vidyasagar; A/Prof J Vingrys

Prerequisites: Optometry 655-221; physiology 536-201 or equivalent

Contact: Twenty-four lectures (two per week) 36 hours practical (three hours per week) work and computer assisted learning (*Semester 2*).

Description: This subject gives an overview of the physiological processes underlying vision and the control of eye movements. The series of lectures on visual processing will deal with the photoceptors and phototransduction, the organisation and function of the retina, the lateral geniculate nucleus, the superior colliculus and the visual cortex. The second series of lectures on ocular control will deal with muscular mechanisms of the eye including the mechanics of translatory, saccadic and slow pursuit eye movements, Listing's Law, neural control of eye movements and binocular eye movements, Hering's Law, accommodation and the accommodative-convergence synkinesis and pupillary reactions.

Assessment: A 3-hour written examination at the end of the semester (85%). Practical work (15%).

Prescribed texts: J G Nicholls, A R Martin and B G Wallace, *From Neuron to Brain*, 3rd edn, Sinauer Associates Inc, 1992. • W M Hart (ed.), *Adler's Physiology of the Eye, Clinical Applications*, 9th edn, Mosby, 1992.

300-level subjects

655-028 Foundations of Visual Neuroscience

Credit points: 12.5

HECS-band: 2

Coordinator: Prof N McBrien

Prerequisites: BOptom students: successful completion of all first-year level subjects plus 655-221.

Other students: 655-222.

Contact: Twenty-four lectures (two 1-hour lectures per week) plus six 2-hour multimedia based tutorials (*Semester 2*).

Description: This subject aims to provide students with a sound neuroanatomical and neurophysiological knowledge base upon which they can understand the structure-function relationships underlying sensory information processing. Although particular emphasis will be given to the elements and processing subserving vision, other sensory modalities such as audition and balance are covered to highlight the similarities and contrast the specialisations among different sensory systems. The foundations begin with an overview of the molecular and cellular mechanisms that allow signal transmission among neurones, and lead to the concept of neural assemblies being built up from cellular building blocks that give rise to the current 'systems approach' to neuroscience. At the end of the course, students should understand the information pathways from sensory end-organs, through the thalamus to specialised cortical targets. In particular the functional organisation of the primary and extrastriate visual cortex will be extensively covered, including feedback systems allowing reflexive binocular visuo-motor control of eye movements. The natural and abnormal development of the retino-striate pathways will also be covered in detail.

Through the lecture series and integrated tutorials, students should apply this fundamental knowledge towards and understanding of the specific deficits underpinning neurological abnormalities and disease processes in the clinical arena. This should also prepare them to engage in the future developments of neuroscience in a laboratory setting.

Assessment: A 3-hour end of semester written examination (70%); continuous assessment comprising a ten-minute multimedia based quiz during each tutorial session (30%).

Prescribed texts: E R Kandel, J H Schwartz, T M Jessell, *Principles of Neural Science*, 3rd edn, Appleton and Lange 1991.

655-321 Visual Physiology and Perception

Credit points: 12.5

HECS-band: 2

Coordinator: A/Prof T Vidyasagar

Prerequisites: Optometry 655-221, 655-222; biochemistry 521-204 or equivalent. Exemption may be obtained with the approval of the Head of Department.

Contact: Forty-eight hours of lectures, tutorials and seminars (*Semester 1*).

Description: This subject provides students with a thorough understanding of processing of visual information by the visual pathways (retino-geniculate-striate system) and the physiology of other ocular components. The subject is presented in a problem-oriented approach and is therefore designed to develop students' skills in reading, analysing and debating scientific papers in the vision sciences. The topics to be studied include the neuro-anatomy of the visual pathways in the context of functional deficits; neuro-transmitters and synaptic circuits; regulation of visual sensitivity, including perception of motion; retinal and cortical electro-physiological responses; post-natal visual development; ocular growth and factors affecting refractive development of the eye; and corneal function and the effects on corneal function of metabolic stress.

Assessment: A 2-hour written examination at the end of the semester (60%). Seminar participation and presentations (40%). A pass must be obtained for seminar participation.

Prescribed texts: Comprehensive reading material in the form of reference lists and reference material will be provided.

655-331 Image Capture, Processing and Display

Credit points: 12.5

HECS-band: 2

Coordinator: Assoc Prof G Smith

Prerequisites: 655-101 or 655-102 Optical Systems (*p.1*).

Contact: Twenty-four hours of lectures, two reading assignments and 24 hours of tutorial/practical classes (*Semester 1*).

Description: This subject is divided into five well-defined but related topics.

- the methods for capture of an image (eg. photographs);
- the recording of the image (eg. using conventional film or electronic recording);
- the processing of the content of the image (eg. spatial filtering and contrast enhancement);
- the display of the image (eg. television systems); and

- the visual ergonomical factors in viewing the displayed image (eg. the use of colour).

In each case the relative advantages and disadvantages of the different techniques will be discussed along with current practical applications.

By completion of this subject, students should have a sound understanding of the recording, processing and display of images, with their applications to industrial, medical and commercial environments and the importance of 'images' in the world around them. Furthermore, students should also be able to advise on a suitable form of image capture, recording, processing and display for a wide variety of situations.

This subject should also allow students to develop the following generic skills:

- critical thinking through problem solving;
- efficient time management in completing assignments; and
- cooperation and teamwork through laboratory work.

Assessment: A 2-hour written examination and assignments throughout the semester.

655-351 Ophthalmic Prosthetics I

Credit points: 12.5

HECS-band: 2

Coordinator: Dr M Pianta; Dr A Metha

Prerequisites: Optometry 655-101 and 655-210

Corequisites: For BOptom students only: Optometry 655-330 and 655-340

Contact: Twenty-four lectures (two per week), 24 hours practical classes and 12 hours of tutorial/computer-aided learning (CAL) (*Semester 1*).

Description: On completion of this subject, students should be familiar with the properties of ophthalmic optical materials and the indications for their use. Understand the optics of ophthalmic lenses and be able to calculate the performance characteristics of ophthalmic lenses and optical devices. Students will be able to dispense prescriptions and check dispensed visual aids to Australian standards. The subject will cover the properties of ophthalmic materials; the optics and design of bifocal and multifocal lenses relating to dispensed spectacle corrections; magnification effects, eikonic corrections and low vision aids; absorptive lenses; safety lenses; ophthalmic dispensing techniques; frame design, materials and adjustments; and dispensing tolerances, prescription verification and vertometry. The practical classes will introduce students to the processes of ophthalmic dispensing. The CAL will include a series of assignments that must be completed and submitted during the semester. Some of these will draw on knowledge from both 655-101 and 655-210.

Assessment: A practical examination in ophthalmic lenses (25%); a 2-hour written examination (75%). Students will be required to pass both practical and written examination components of the assessment and will also need to satisfactorily complete all of the CAL assignments to obtain a pass in this subject.

Prescribed texts: M Jalie, *Ophthalmic Lenses and Dispensing*, Butterworths, 1999. An additional reference list will be provided.

600-312 Research Project B

See full subject details on page 1.

Available to BOptom students only

655-201 Anatomy & Histology of the Eye

Note: This subject is only available to BOptom students.

Credit points: 12.5

HECS-band: 2

Coordinator: Dr E L Fletcher

Prerequisites: Optometry 655-201; biology 600-141 and 600-142.

Contact: Thirty-six lectures, 24 hours of practical and tutorial classes (*Semester 1*).

Description: This subject covers the detailed anatomy and histology of the eye, orbit and visual pathways. Upon completion of this subject students should comprehend the terminology of histology and cytology; be able to identify and interpret the light and electron microscopic appearance of cells and tissues; the histology of the eye, orbit and visual pathways; the embryological development of the eye; and the neuroanatomy of the visual pathways. A series of lectures will give an introduction to histology and will be supplemented by practical work on examination of histological preparations. A further series of lectures will be given on the histology and detailed anatomy of the eye, orbit and visual pathways with associated practical classes.

At the end of this subject, students should have a firm foundation on which to understand how ocular structures are altered during disease. Students should also develop communication skills (written and oral) necessary to describe the structures of the eye. Students should be able to describe ocular structure using a range of techniques, and understand the importance of one's own observations and the scientific basis of knowledge about ocular histology, and

the need for continuing independent learning to keep pace with future advances.

Assessment: A 2-hour written examination at the end of semester (80%) and assessment of practical work (20%).

Prescribed texts: A J Bron, R C Tripathi and B J Tripathi, *Wolff's Anatomy of the Eye and Orbit*, 8th edn, Chapman and Hall, 1997.

655-202 Optical Systems

Credit points: 12.5

HECS-band: 2

Coordinator: Assoc Prof G Smith; Dr A Metha

Prerequisites: None

Contact: Thirty-six lectures (three per week), 12 tutorials, 36 hours practical work and computer assisted learning (*Semester 2*).

Description: The topics to be covered are image formation by simple lenses, mirrors, prisms and complex optical systems, along with associated phenomena such as paraxial optics, aberration theory, image quality, diffraction, interference, polarisation and thin films. This basic knowledge will be applied to particular common visual instruments such as microscopes, telescopes and the human eye.

At the end of the subject, the student should understand how images are formed by simple lenses and more complex optical systems (in particular the eye) and the factors that affect the nature and quality of these images. In particular, given the structure of a system, students should, by using basic ray tracing rules, be able to predict the position and size of the image.

The material covered in this subject involves trigonometry, geometry and the analysis of two- and three-dimensional diagrams. Therefore at the end of the subject, students should have enhanced skills in basic mathematics and in dealing with two- and three-dimensional spatial relationships.

This subject should also allow students to develop the following generic skills:

- critical thinking through problem solving;
- efficient time management in completing assignments; and
- cooperation and teamwork through laboratory work.

Assessment: A 3-hour written examination at the end of the semester (70%); weekly tests associated with the practical classes and an assessment of practical work (30%). A pass must be obtained for the practical work.

Prescribed texts: G Smith and D A Atchison, *The Eye and Visual Optical Instruments*, Cambridge University Press, 1997.

655-330 Functional Disorders of Vision

Note: This subject is only available to BOptom students

Credit points: 25

HECS-band: 2

Coordinator: Prof N A McBrien; Dr S Haymes

Prerequisites: Optometry 655-101, 655-210, 655-222

Corequisites: Optometry 655-340, 655-351, 655-352

Special requirements: Students should have an approved direct ophthalmoscope and retinoscope, gonioscope, binocular indirect ophthalmoscope, two fundus lenses epilation forceps, two white coats, pre-focused pen torch or transilluminator, inter-pupillary rule, a set of optical screwdrivers, cover paddle, phoria card and a set of four flippers. Students are strongly advised to purchase their own equipment which they will continue to use in fourth year and after graduation. However, those students who do not have their own equipment will be able to borrow equipment for classes. Students are required to conform to the dress and conduct requirements of the Board of Management of the Clinic of the Victorian College of Optometry when assigned to the clinic.

Contact: Seventy-two lectures (three a week), 144 hours practical work (six hours a week through the year) which includes rostered clinical practice in the last eight weeks of Semester 2 (*Year long*).

Description: This subject gives a detailed account of the nature, origins, course, treatment and prognosis of the congenital and developmental disorders of vision and provides training in the optometric procedures for the examination of the eyes and for the treatment of visual disorders. On completion of the subject students will be able to investigate patients' visual problems, make a diagnosis and plan an appropriate course of management. Topics include refractive anomalies of the eye including explanations of the origin and development of refractive errors and methods of refraction; anomalies of accommodation including presbyopia; the anomalies of ocular motility and binocular vision including their clinical assessment and treatment; disorders of the light sense; strategies of problem solving, history taking and case assessment. A series of lectures in Semester 2 is devoted to scientific method in the clinical sciences. Practical sessions introduce students to the methods of determination of refraction, assessment and treatment of disorders of ocular motility and binocular coordination, and the detection of ocular disease. Students are required to complete weekly assignments to develop their clinical skills. In the last eight weeks of Semester 2, students undertake clinical practice and the examination of patients in the clinic.

Assessment: A 3-hour written paper at the end of Semester 1 and a 3-hour written paper at the end of Semester 2. A 75-minute practical examination in clinical methods is held at the end of Semester 1 which must be passed in order to proceed with clinical practice in Semester 2. A 1-hour practical examination in advanced clinical methods is held at the end of Semester 2 which must be completed satisfactorily in order to pass the subject. Students must also achieve a satisfactory standard in clinical practice to pass the subject. Reports on clinical methods assignments contribute 15% to the final mark.

Prescribed texts: A G Bennett and R B Rabbetts, *Clinical Visual Optics*, 3rd edn, Butterworths, 1998. • M Scheiman and B Wick, *Clinical Management of Binocular Vision*, Philadelphia Lippincott, 1994. • K Zadnik, *The Ocular Examination, Measurements and Findings*, W B Saunders, 1997.

655-340 Diseases of The Eye

Note: This subject is only available to BOptom students.

Credit points: 25

HECS-band: 2

Coordinator: Assoc Prof A J Vingrys

Prerequisites: Optometry 655-201 and 655-211; anatomy 516-208; pathology 531-202, biochemistry 521-204.

Corequisites: Microbiology 526-306; pharmacology 534-307; optometry 655-330, 655-351 and 655-352.

Contact: Seventy-two lectures (three a week) and 12 2-hour demonstration classes (*Year long*).

Description: On completion of this subject, students will be thoroughly familiar with the nature, origins, course and prognosis of diseases of the eye, have a sound understanding of the treatment of the most commonly presenting eye diseases and will have acquired the skills necessary for the examination of the eyes for signs of eye disease and the ability to make a diagnosis. The subject covers the pathology, cause, course and clinical management of ocular diseases and of systemic diseases having ocular manifestations.

Assessment: A 2-hour written paper at the end of Semester 1 and a 2-hour written paper at the end of Semester 2 (37.5% each); a practical/oral examination (10%) and a slide test on eye disease recognition (15%) at the end of Semester 2.

Prescribed texts: R Berko R (ed.), *The Merck Manual of Diagnosis and Therapy*, 16th edn, Merck Sharp and Dohme, 1992. • J J Kanski, *Clinical Ophthalmology*, 3rd edn, Butterworths, 1994. • D R Cullom and B Chang, *The Wills Eye Manual and Emergency Room Diagnosis and Treatment of Eye Disease*, 2nd edn, Philadelphia Lippincott, 1993. • J D Bartlett and S D Jaanus, *Clinical Ocular Pharmacology*, 3rd edn, Boston, Butterworth-Heinemann, 1995.

655-352 Ophthalmic Prosthetics II

Note: This subject is only available to BOptom students.

Credit points: 12.5

HECS-band: 2

Coordinator: Dr E L Fletcher

Prerequisites: Optometry 655-101, 655-210, 655-351; biochemistry 521-204.

Corequisites: Optometry 655-330, 655-340; microbiology 526-306.

Contact: Thirty-six lectures (three a week) and 12 hours of tutorials (*Semester 2*).

Description: On completion of this subject, students will have a broad understanding of contact lens practice. The subject covers the underlying physiological and optical principles of contact lenses, the measurement of contact lens specifications using relevant instrumentation, the handling of contact lenses and routine procedures for cleaning and disinfecting hard and soft contact lenses, the insertion and removal of hard and soft contact lenses; the conduct of a preliminary examination for contact lenses, techniques for assessment of the physical fit of contact lenses on the eye, the rationales behind current methods of fitting the various types of contact lenses including the high Dk soft extended wear lenses and the recognition, interpretation and management of signs and symptoms and abnormal conditions which may be induced by contact lens wear.

Assessment: A 3-hour written examination at the end of semester (100%).

Prescribed texts: A Gasson and J Morris, *The Contact Lens Manual: A Practical Fitting Guide*, 2nd edn, Butterworth, 1998. • M Hom (ed.), *Manual of Contact Lens Fitting and Prescribing*, Butterworth-Heinemann, 1997.

655-360 Psychophysical Aspects of Vision

Credit points: 6.25

HECS-band: 2

Coordinator: Dr A Gentle

Prerequisites: Approval from Head of Department

Contact: Twelve 1-hour tutorials (*Semester 2*).

Description: The purpose of this subject is to provide candidates with a broad knowledge of biomedical and psychophysical scientific principles which

underlie our understanding of the structure and function of the eye. Such a grounding is important in the subsequent appreciation of the mechanisms with lead to ocular abnormality, pathology and visual dysfunction. The subject content will include a review of basic ocular anatomy, embryology and neurology, along with basic ocular biochemistry and microbiology. In addition, the psychophysical principles which underlie light sense, colour vision, form sense (spatial/temporal resolution) and the perception of depth will be considered.

On completion of this subject students should:

- demonstrate an ability to critically evaluate and synthesise research literature;
- have developed an understanding of the importance of regularly refreshing their knowledge base through use of the relevant scientific and professional literature;
- be competent in seeking and retrieving information using a number of resources such as the world wide web;
- be able to manage competing demands on their time; and
- appreciate the ways in which advanced knowledge can equip one with enhanced problem-solving skills for application in a clinical environment.

Assessment: One 2-hour written examination at the end of semester.

Prescribed texts: Students will be provided with a comprehensive study guide. Prescribed texts are from the American Academy of Ophthalmology Basic and Clinical Science Course. *Section 2 (Fundamental and Principles of Ophthalmology)* and *Section 5 (Neuro-Ophthalmology)* American Academy of Ophthalmology, 1998

655-410 Optometry

Note: This subject is only available to BOptom students.

Credit points: 87.5

HECS-band: 2

Coordinator: Prof N A McBrien

Prerequisites: Optometry 655-330, 655-340, 655-351, 655-352.

Contact: Sixty lectures; 36 tutorials and seminars; 24 hours of ophthalmological case discussions; 72 hours of project work and no less than 450 hours of clinical work and clinical demonstrations. Clinical work and some lecture and some practical classes are held in the three weeks before Semester 1 and for three weeks between Semesters 1 and 2. Students are rostered to attend the general, binocular vision, contact lens, and community health clinics of the Victorian College of Optometry, the Low Vision Clinic at Kooyong for 32 weeks, and the Broadmeadows Community Health Centre. Students are also rostered to attend two approved private practices in the city and the country. Students have the opportunity to undertake four to six weeks of clinical training in an overseas clinical setting in the weeks between semesters. Those who do not take an overseas externship spend one week in a country private practice (*Year long*).

Description: On completion of this subject, students will have a broad and strong command of their knowledge of the disorders of vision and their management; have developed a very high level of skill with optometric procedures and will be competent in the identification, diagnosis and resolution of patient visual problems. They will also be skilled in patient communication. The core of the subject is the examination and treatment of patients in the clinics of the Victorian College of Optometry and attendance at clinical demonstrations of patients exhibiting unusual clinical features. In addition, lectures and tutorials will provide detailed instruction in the management and rehabilitation of patients with severe visual impairment, the management of children's vision, management of ocular disease, general medicine with emphasis on those systemic diseases with ocular manifestations, and the diagnosis and management of abnormal colour vision. Students will also conduct a practical research project or detailed literature survey and complete a 6000-10 000 word dissertation. Students are also required to dispense a proportion of the spectacle prescriptions they write during their attendance at clinics and complete other dispensing assignments.

Assessment: Two 3-hour and one 2-hour end-of-year written examinations (42.5%); progressive assessment of clinical work during the year and a clinical examination at the end of Semester 1 (37.5%); a project dissertation on an approved subject (10%); an oral examination, written clinical reports and assessment of participation in review clinics (10%). Each component must be passed.

Recommended texts: In addition to the prescribed texts purchased for second- and third-year subjects, students are strongly advised to purchase:

J D Bartlett and S D Janus, *Clinical Ocular Pharmacology*, 3rd edn, Butterworth-Heinemann, 1995.

655-420 Occupational and Community Optometry

Note: This subject is only available to BOptom students.

Credit points: 12.5

HECS-band: 2

Coordinator: Prof N A McBrien; Dr S Haymes

Prerequisites: Students must have passed all subjects at third-year level.

Corequisites: Optometry 655-410.

Contact: Twenty-eight lectures plus three tutorials (*Semester 2*).

Description: The subject covers specifically, the principles underlying the setting and administration of visual standards, human factors engineering of the task and environment to improve visual performance, the principles of illuminating engineering, vision screening as a public health measure and the principles of accident prevention and their application to the prevention of eye injuries. A series of lectures deals with ethics, practice standards, the law in relation to optometry, and practice management.

The general purpose of this subject is to acquaint students with the concepts of public health and the role of optometry in community health and to have a well-developed sense of their ethical, professional and legal responsibilities. The subject also sets out to provide students with the skills to provide advice to industry and commerce on visual ergonomics, visual standards and occupational eye protection. On completion of this subject, student should have acquired the following key generic skills: the ability to confront and solve unfamiliar problems, effective time management, and an understanding of the significance and value of a profession to the wider community.

Assessment: A 2-hour end-of-semester written examination (75%); and small assignments throughout the year (25%)

Prescribed texts: D G Pitts and R N Kleinstein, *Environmental Vision*, Butterworth-Heinemann, 1993.

