SCHOOL OF OPTOMETRY

BACHELOR OF SCIENCE DEGREE
WITH HONOURS IN
OPTOMETRY

SYLLABUSES
(Credit-based)

2005
## CONTENTS

<table>
<thead>
<tr>
<th>Semester One</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anatomy for Optometry (SO206)</td>
<td>3</td>
</tr>
<tr>
<td>Visual Science 1 (SO207)</td>
<td>5</td>
</tr>
<tr>
<td>Introductory Cell Biology and Biochemistry (ABCT212)</td>
<td>7</td>
</tr>
<tr>
<td>Foundation Physiology I (ABCT216)</td>
<td>9</td>
</tr>
<tr>
<td>Optics 1 (AP219)</td>
<td>11</td>
</tr>
<tr>
<td>Generic Anatomy (HSS201)</td>
<td>13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester Two</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Optometry 1 (SO202)</td>
<td>15</td>
</tr>
<tr>
<td>Ocular Physiology (SO209)</td>
<td>18</td>
</tr>
<tr>
<td>Visual Science 2 (SO315)</td>
<td>21</td>
</tr>
<tr>
<td>Foundation Physiology II (ABCT217)</td>
<td>24</td>
</tr>
<tr>
<td>Foundation Mathematics (AMA212)</td>
<td>26</td>
</tr>
<tr>
<td>Optics 2 (AP229)</td>
<td>28</td>
</tr>
<tr>
<td>Applied Microbiology (HTI2516)</td>
<td>30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester Three</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ophthalmic Optics and Dispensing 1 (SO307)</td>
<td>32</td>
</tr>
<tr>
<td>Clinical Optometry 2 (SO308)</td>
<td>35</td>
</tr>
<tr>
<td>Visual Science 3 (SO313)</td>
<td>38</td>
</tr>
<tr>
<td>Applied Statistics and Research Methodology (HTI376)</td>
<td>41</td>
</tr>
<tr>
<td>Psychology in Health Care (SN3401)</td>
<td>44</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester Four</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Optometry 3 (SO310)</td>
<td>46</td>
</tr>
<tr>
<td>Ophthalmic Optics and Dispensing 2 (SO311)</td>
<td>49</td>
</tr>
<tr>
<td>Visual Science 4 (SO314)</td>
<td>52</td>
</tr>
<tr>
<td>Putonghua for Optometry (CLC216)</td>
<td>55</td>
</tr>
<tr>
<td>English in the Workplace for Optometry (ELC3605)</td>
<td>57</td>
</tr>
<tr>
<td>Foundation Pathology (HTI256)</td>
<td>59</td>
</tr>
<tr>
<td>Semester</td>
<td>Course</td>
</tr>
<tr>
<td>----------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Five</td>
<td>Clinical Binocular Vision (SO415)</td>
</tr>
<tr>
<td></td>
<td>Contact Lens Practice (SO423) <strong>(Semester 5 &amp; 6)</strong></td>
</tr>
<tr>
<td></td>
<td>Optometry Specialisms (SO425)</td>
</tr>
<tr>
<td></td>
<td>Ocular Pathology (SO434)</td>
</tr>
<tr>
<td></td>
<td>Clinical Optometry 4 (SO443)</td>
</tr>
<tr>
<td></td>
<td>Professional Studies (SO445)</td>
</tr>
<tr>
<td>Six</td>
<td>General and Ocular Pharmacology (SO410)</td>
</tr>
<tr>
<td></td>
<td>Optometry Clinic 1 (SO416)</td>
</tr>
<tr>
<td></td>
<td>Community Optometry (SO421)</td>
</tr>
<tr>
<td></td>
<td>Practice Management (SO431)</td>
</tr>
<tr>
<td></td>
<td>Project 1 (SO438)</td>
</tr>
<tr>
<td>Seven</td>
<td>Case Conference 1 (SO432)</td>
</tr>
<tr>
<td></td>
<td>Optometry Clinic 2 (SO441)</td>
</tr>
<tr>
<td></td>
<td>Project 2 (SO446)</td>
</tr>
<tr>
<td></td>
<td>Contact Lens Clinic 1 (SO448)</td>
</tr>
<tr>
<td>Eight</td>
<td>Case Conference 2 (SO433)</td>
</tr>
<tr>
<td></td>
<td>Project 3 (SO447)</td>
</tr>
<tr>
<td></td>
<td>Contact Lens Clinic 2 (SO449)</td>
</tr>
<tr>
<td></td>
<td>Optometry Clinic 3 (SO450)</td>
</tr>
</tbody>
</table>
Learning Outcomes

On completion of this subject, the student should be able to:
1. identify different ocular structures
2. identify different structures related to the visual pathway
3. recognize the relationship between different structures in the visual system
4. recognize the functions between different structures in the visual system
5. use his/her knowledge of ocular anatomy to explain clinical presentations and conditions

Outline Syllabus

Embryology of the eye
The orbit
Structures and media within the eyeball
The ocular adnexa
Nerve supply to the eye, orbit and adnexa
Vasculature in the eye, orbit and adnexa
The visual pathway
The extra-ocular muscles

Indicative Content

Embryology of the eye: the sequence of events in the development of the eye and its appendages in the human foetus.
(1 hour)

The orbit: bones which make up the orbit and the various fossae and canals in the orbit.
(2 hours)

Structures and media within the eyeball: a detailed study of the different layers of the eyeball, their structures and functions.
(8 hours)

The ocular adnexa: the eyelids, lacrimal glands and tear drainage system.
(2 hours)
Nerve supply to the eye, orbit and adnexa: motor, sensory and autonomic nerve supply.
(3 hours)

Vasculature in the eye, orbit and adnexa: arterial supply and venous drainage; origins and destinations.
(2 hours)

The visual pathway: the location and anatomical nature of structures comprising the visual pathway; arrangement of nerve fibres from retina to visual cortex; implications of this arrangement on binocularity and the visual fields.
(3 hours)

The extraocular muscles: anatomy, functions, nervous and vascular supply.
(2 hours)

Laboratory work: reinforces lecture material by the observation of anatomical models, histological sections.
(6 hours)

Tutorials will be used to provide remediation for individual students when necessary.
(3 hours)

**Assessment**

| Coursework | 50% |
| Examination | 50% |

(2 hour written paper)

**Reading List**

**Prescribed Reading**


**Recommended Reading**


Learning Outcomes

On completion of this subject, students should be able to
1. describe the methods for measuring different ocular components and give their appropriate dimensions
2. define different refractive errors, and the cause(s) of each of them
3. calculate the retinal image size from different refractive errors and optical corrections
4. create a visual acuity chart
5. compare and contrast different optometers
6. discuss the relationship between different accommodative stimuli on accommodative
7. apply appropriate knowledge to the eye examination

Outline Syllabus

Measurement of ocular components
Optics of the eye
Emmetropia and ametropia
Visual acuity
Optometers
Retinal image size and magnification
Accommodation

Indicative Content

Measurement of ocular components (4 hours)
Methodology and techniques of ocular measurements including ultrasonography, keratometry and pachometry; frequency of distribution of ocular component dimensions

Optics of the eye (4 hours)
Optical properties of different ocular structures; different schematic eye models
Emmetropia and ametropia (4 hours)
Definition of different refractive conditions; frequency of distributions of ametropia

Retinal image size and magnification (4 hours)
Effects of refractive errors on retinal image size; spectacle and contact lens correction on retinal image size

Visual acuity (4 hours)
Limitations for visual resolution; introduction to visual acuity measurement; design of visual acuity chart; factors affecting visual acuity

Optometers (4 hours)
Optics and principles of the simple optometer, Badal's optometer, Young's optometer, retinoscopy

Accommodation (4 hours)
Relationship between stimulus and response; mechanism and properties of accommodation; spectacle and ocular accommodation

Laboratory work: reinforce lecture material by experimental study into aspects of visual optics such as ocular dimensions, visual acuity, accommodation, optometers. (12 hours)

Assessment

Coursework 40%
(written assessment and quizzes)

Examination 60%
(2 hours written paper)

Reading list

Prescribed Reading

Recommended Reading
Subject Title : Introductory Cell Biology and Biochemistry  
Code : ABCT212

Credits : 3  
Level : 2
Status : Compulsory  
Stage : 1
Offering Department: ABCT  
Semester : 1

Teaching Pattern

Lecture 38 hours
Tutorial 4 hours

42 hours

Learning Outcomes

On completion of this subject, the student should be able to:
1. identify the structures and functions of cell organelles and the cell as an entity, and of the modern techniques used in cell biology
2. explain the basis of functional system within an organism with the cell as the basic building block
3. explain the fundamental concepts in biochemistry
4. appreciate the role of biologically important molecules in living systems
5. explain the interactions between different biochemical pathways in the body

Outline Syllabus

Cell structure and functions
Cell cycles and development of cell specificity in eukaryotes
Introduction to modern methods in cell biology
Structure, properties and functions of molecules of life
Catabolism and generation of energy
Biosynthesis and utilization of energy

Indicative Content

Cell structure and functions: prokaryotic and eukaryotic cells, the architecture of plasma membrane, transport across membrane, internal membranes and cell energetic, chemical signaling between cells, cytoskeleton and cell movement, cilia and flagella, endoplasmic reticulum, ribosomes, Golgi apparatus, lysosomes and peroxisomes and the nucleus (7 hours)

Cell cycles and development of cell specificity in eukaryotes, cell cycle and cells in early stage of development, determination and differentiation of cells in higher eukaryotes, maintenance of adult organs by stem cells (6 hours)
Introduction to modern methods in cell biology: microscopy and histological methods, cell fractionation and analysis of subcellular components, cytochemical techniques, autoradiography and radioisotope labeling techniques (7 hours)

Structure, properties and functions of molecules of life: water, carbohydrates, lipids, proteins and vitamins. Vision biochemistry and its relation to Vitamin A. (7 hours)

Enzymes: nature and mode of action of enzymes, regulation and importance in biological systems, isoenzymes and coenzymes, enzyme kinetics (4 hours)

Catabolism and generation of energy: bioenergetic principles, glycolysis, citric acid cycle, hexose monophosphate shunt, electronic transport, oxidation of fat, proteolysis, deaminations, fate of carbon skeleton, urea cycle (8 hours)

Biosynthesis and utilization of energy: gluconeogenesis, glycogenesis, biosynthesis of lipids, amino acids and proteins (6 hours)

Tutorials are aimed at clarifying material related to lectures and background reading. They will be organized as group discussion on (a) assigned structured problems and (b) areas of weakness identified through continuous assessment or structure self-learning processes. The hours given for the indicative content include 4 tutorials classes.

**Assessment**

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coursework</td>
<td>50%</td>
</tr>
<tr>
<td>(2 one-hour written assessment)</td>
<td></td>
</tr>
<tr>
<td>Examination</td>
<td>50%</td>
</tr>
<tr>
<td>(2 hours written paper)</td>
<td></td>
</tr>
</tbody>
</table>

**Reading List**

**Prescribed Reading**


Subject Title: Foundation Physiology I  
Code: ABCT216  
Credits: 3  
Level: 2  
Status: Compulsory  
Stage: 1  
Offering Department: ABCT  
Semester: 1

Teaching Pattern

Lecture: 32 hours  
Laboratory: 6 hours  
Tutorial: 6 hours  

44 hours

Learning Outcomes

On completion of this subject, the student should be able to:
1. describe the normal functioning of the human body with emphasis on the mode of mechanisms  
2. appreciate the integrative nature of the operation of different body systems in health and illness  
3. explain how different physiological systems work together to maintain bodily functions  
4. demonstrate an analytical and critical mind through a process of question and problem solving

Outline Syllabus

Tissue types and organization  
Nervous system  
Endocrine system  
Cardiovascular system  
Respiratory system

Indicative Content

Tissue types and organization: Classification of tissues, histological structure and function of tissues; general organization of the human body in relation to organs and systems.

Nervous system: Classification, structure, function and properties of neurons and synapses; basic anatomy and divisions of the nervous system; roles of the central as well as the autonomic nervous system; receptors and chemical transmission at nerve-nerve and nerve-muscle junctions; neurotransmitters; organization and function of the sensory system for both general and special senses; control of body movement.
Endocrine system: Definitions of hormone, endocrine glands; physiological functions of major types of hormones; general mechanisms of hormone actions such as of steroids and peptide; structure of pituitary gland and hypothalamus and the regulations of hormone release.

Cardiovascular system: Structure and function of the heart and blood vessels; control of cardiac functions; function of the systemic and pulmonary circulation; haemodynamics; components and properties of blood; structure and function of the lymphatic system.

Respiratory system: Organization and structure of the respiratory system; ventilation and lung mechanics; exchange of gases in alveoli and tissues; transport of blood gases; chemical control of ventilation.

Practical: Measurements of nervous stimulus intensifies; summation of stimuli; latent period; effects of neurotransmitters on the cardiac functions; localization of the pacemakers; measurement of blood pressure and ECG in humans; investigation on the chemical control of ventilation.

Tutorials: Class activities be engaged to students to exercise the theory-practical integration in the various body systems.

Assessment

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coursework</td>
<td>50%</td>
</tr>
<tr>
<td>Examination</td>
<td>50%</td>
</tr>
</tbody>
</table>

Reading List

Tortora & Grabowski (2000) Principles of Anatomy and Physiology

Vander, Sherman & Luciano (2000) Human Physiology


Subject Title : Optics 1     Code : AP219
Credits : 2      Level : 2
Status : Compulsory    Stage : 1
Offering Department : AP      Semester : 1

Teaching Pattern

Lecture                     18 hours
Laboratory                  10 hours
Tutorial                    5 hours

__________
33 hours

Learning Outcomes

On completion of this subject, the student should be able to:
1. describe the physical phenomena of practical geometrical optics
2. identify and solve some optical problems
3. demonstrate knowledge of physical and geometrical optics essential for the future study of visual and ophthalmic science

Outline Syllabus

Optics of thick lenses and lens systems
Lens aberrations
Optical instruments

Indicative Content

Gaussian optics - reflection and refraction at plane and spherical surfaces; cardinal points of thick lenses and lens systems; image forming systems.
(10 hours)

Aberrations - dispersive power of optical materials; achromatic prisms and lenses; monochromatic aberrations; ray tracing.
(6 hours)

Optical instrumentation: stops, pupils and windows; cameras, simple magnifiers and eyepieces, microscopes, telescopes.
(7 hours)

Practical work: basic optical techniques.
(10 hours)
Assessment

Coursework 40%
Examination 60%
(2 hour written paper)

To pass the subject, students must obtain grade D or above in the examination.

Reading List

Prescribed Reading


Recommended Reading

Subject Title : Generic Anatomy  
Code : HSS201  

Credits : 3  
Level : 2  

Status : Compulsory  
Stage : 1  

Offering Department: FHSS  
Semester : 1  

Teaching Pattern  

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>28</td>
</tr>
<tr>
<td>Tutorial/ on-line exercise</td>
<td>14</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>42</strong></td>
</tr>
</tbody>
</table>

Learning Outcomes  

On completion of this subject, the student should be able to:  
1. describe the structure of the human body with respect to systemic anatomy  
2. describe the corresponding functions of the body systems  
3. integrate systemic and regional anatomy with respect to medical of body parts  
4. demonstrate basic skills in applying medical terminology when deemed appropriate  

Outline Syllabus  

Introduction to the human body and anatomical terminology  

Lecture series in Systemic Anatomy  
  Integumentary system  
  Musculoskeletal system  
  Nervous system  
  Sensory organs  
  Cardiovascular system  
  Lymphatic system  
  Respiratory system  
  Digestive system  
  Urinary system  
  Reproductive system  

Integration to Regional and Imaging Anatomy  
  Head and Neck  
  Neuroanatomy  
  Thorax  
  Abdomen and Pelvis  
  Upper limb and Lower limb
Indicative Content

Introduction to the human body and anatomical terminology (2 hours)
Integumentary system (2 hours)
Musculoskeletal system (4 hours)
Nervous system and sensory organs (4 hours)
Cardiovascular system and Lymphatic system (4 hours)
Respiratory system (2 hours)
Digestive system (2 hours)
Urinary system (2 hours)
Reproductive system (2 hours)
Integrated regional anatomy (4 hours)

Tutorial and on-line exercise (14 hours): to reinforce the lecture materials with case-based discussion and observation of dissected specimens via interactive software in anatomy

Assessments

Class test and on-line assignments 50%
Final Examination 50%

Reading List

Prescribed Reading


Reference of interest

Lau TYH. Anatomy Project CD-ROM with integrated text, Department of Health Technology and Informatics (Former Department of Optometry and Radiography, FHSS, PolyU, 2003. Address correspondence to Thomas Lau; E.mail: orthomas@polyu.edu.hk


Subject Title : Clinical Optometry 1  
Code : SO202
Credits : 3  
Level : 2
Status : Compulsory  
Stage : 1
Offering Department: SO  
Semester : 2

Teaching Pattern

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>24</td>
</tr>
<tr>
<td>Laboratory</td>
<td>33</td>
</tr>
<tr>
<td>Tutorial</td>
<td>3</td>
</tr>
<tr>
<td>Field work</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>63</td>
</tr>
</tbody>
</table>

Learning Outcomes

On completion of this subject, the student should be able to:
1. interpret background information collected from the patients in primary eye care
2. practise preliminary optometric procedures and draw tentative diagnosis effectively
3. measure the refractive errors objectively and subjectively
4. diagnose types of refractive errors and identify cases with subnormal visual acuity
5. manage the ametropia optically
6. take up professional responsibility in the community and appreciate the need to learn continuously in primary eye care

Outline Syllabus

The preliminary examination
Assessment of visual acuity
Retinoscopy
Clinical use of keratometry in refraction
Auxiliary refractive techniques
Subjective refraction

Indicative Content

The preliminary examination: the goals of performing preliminary tests. History taking; habitual VA and its significance; the Hirschberg test and angle kappa test, the theory and methods of the unilateral and alternate cover tests; assessment of binocular motility; the near point of convergence and other evaluations; the near point of accommodation, the evaluation of ocular dominance will be discussed. The evaluation of normal and abnormal pupil responses and iris colour. Investigation of confrontation visual fields and screening for central field will be discussed.
(7 hours)
Assessment of visual acuity: concepts of aided and unaided acuity; comparisons between systems of recording visual acuity; clinical methods of measurement; relationships between refractive error and acuity, high contrast versus low contrast visual acuity. Effect of amblyopia and abnormal eye conditions on vision. (3 hours)

Retinoscopy: spot and streak retinoscopy – static methods; retinoscopy in astigmatism; near point retinoscopy - the Mohindra technique; dynamic methods; variations of dynamic retinoscopy - MEM retinoscopy, chromoretinoscopy. Application of these results will be discussed. (4 hours)

Keratometry: Clinical application in refraction. (1 hours)

Auxiliary refractive techniques: principles, methods and applications of autorefraction, photorefraction and laser refraction. (2 hours)

Subjective refraction: monocular subjective refraction; principles and methods - fogging techniques, fan and block techniques, Jackson's crossed cylinder; monocular refractive endpoints - +1.00D blur, duochrome tests; binocular equalisation methods - infinity balance, prismatic techniques; binocular subjective refraction; near subjective refraction. (7 hours)

Laboratory work: All lectures are augmented by appropriate laboratory work emphasising the acquisition of basic clinical skills in the methods of optometric examination. Students will be expected to compare, contrast and evaluate examination methods, and to practice the implementation. Laboratory attendance is compulsory. All students have to participate in a 3-hr equivalent project (e.g. vision screening) in the community.

Tutorials: small-group discussions on clinically related topics will take place, e.g. discussion of clinical examination strategies, relationship amongst tests, comparative evaluation of procedures.

Assessment

Coursework 60%
(Students must pass the laboratory assessment)

Examination 40%
(2 hour written paper)
Reading List

Prescribed Reading

Grosvenor TP. Primary Care Optometry, 4th Ed., Butterworth & Heinemann, 2002

Benjamin WJ. Borish’s Clinical Refraction. WB Saunders, Philadelphia. 1998


Recommended Reading

Amos JF (ed) Diagnosis and Management in Vision Care, Butterworths, Singapore. 1987

On completion of this subject, the student should be able to:
1. list and describe the functions of cornea, its different layers and relate those with the common conditions that affect the cornea and vision
2. describe and appreciate the origin and functions of tears, tears film and their importance in relation to ocular health
3. identify and relate functions of the crystalline lens to vision
4. list the structures and mechanisms involved in the accommodation and describe the mechanism of presbyopia in terms of the malfunction of accommodation
5. describe the mechanism of aqueous humour formation, its function and composition and relate the understandings to intraocular pressure (IOP) and ocular pathophysiology
6. define reflex arc, appreciate and describe various ocular reflexes, namely, the pupillary reflexes, the eye movement reflexes, the lid reflexes and the accommodation reflexes
7. describe the structures and functions of the various layers of the retina, phototransduction mechanism and appreciate the relationship of the retinal functions with the various vegetative functions of other ocular structures
8. describe some aspects of normal tear physiology, namely, pH, secretion rate of tears (using Schirmer test and cotton thread test), tear film break up time and glucose concentration in tears
The eyelids
Production and drainage of tears
Retinal photochemistry

**Indicative Content**

The cornea: function, metabolism and maintenance of transparency (4)

Production and drainage of aqueous humour: its composition, metabolism, mechanism of production and routes of drainage

The intraocular pressure: its origin, range of distribution in the population; measurement; diurnal variations (4)

The vitreous humour: its production, composition, metabolism, and functions (2)

The crystalline lens: metabolism and functions, general discussion on the formation of cataract Accommodation: its function, causes and control; the nature and causes of presbyopia (4)

The pupil: factors controlling pupil size; relationship between pupil size and visual function

Reflex arcs: the nervous pathway of various ocular reflexes including pupillary, accommodation and convergence; eye movements (2)

The eyelids: control of the blink actions; functions of eyelid glands and secretory cellsProduction and drainage of tears: composition, function and drainage of tears (2)

The retina: metabolism and functions of the various layers. Photochemistry of vision: visual pigments; chemical nature of rhodopsin; responses to light (4)

(22 hours)

Two hours are set aside for assessment.

Laboratory work: reinforces lecture material by experimental study into aspects of physiology such as intra-ocular pressure, the lacrimal apparatus and tears and corneal function (9 hours).

Tutorials will be used to support student's self-learning activities and to provide remediation for individual students when necessary (5 hours).

**Assessment**

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coursework</td>
<td>50%</td>
</tr>
<tr>
<td>Examination</td>
<td>50%</td>
</tr>
</tbody>
</table>

(2 hour written paper)
Reading List

Prescribed Reading


Recommended Reading

Subject Title: Visual Science 2
Code: SO315
Credits: 3
Level: 3
Status: Compulsory
Stage: 1
Offering Department: SO
Semester: 2

Students are required to have attended: Anatomy for Optometry (SO206)

Teaching Pattern

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>28</td>
</tr>
<tr>
<td>Laboratory</td>
<td>12</td>
</tr>
<tr>
<td>Tutorial</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>44</td>
</tr>
</tbody>
</table>

Learning Outcomes

On completion of this subject, students should be able to
1. compare and contrast the binocular vision of human and different animals
2. discuss the concept of horopter and its measurement methods
3. apply the horopter concept on fixation disparity and depth perception
4. classify heterophoria and different monocular and binocular vergence eye movements
5. describe the effect of different radiations to the eye and the effects of ocular aberrations on vision
6. discuss the effect and application of different entoptic phenomena
7. apply appropriate knowledge on clinical eye examination

Outline Syllabus

Binocular vision in humans and other animals
Binocular interaction
Sensory aspects of binocular vision
Depth perception and stereopsis
Aniseikonia
Normal eye movements
Fusional responses and near vision complex
Development of normal binocular vision
Ocular transmission and aberrations
Entoptic phenomena

Indicative Content

Binocular vision in humans and other animals (2 hours)
Anatomical and structural features in different species with binocular vision; levels of binocularity in different species; evolution and environmental adaptation
Sensory aspects of binocular vision (4 hours)
Visual projection; corresponding and disparate retinal points; theoretical and empirical horopters; Panum's area and fusional space; physiological diplopia; fixation disparity

Fusional responses and near vision complex (4 hours)
Fusional movement; heterophoria; accommodation, convergence and pupillary reaction

Depth perception and stereopsis (3 hours)
Physical factors aiding depth judgment; stereopsis; theoretical models for stereopsis

Normal eye movements (3 hours)
Fixation eye movement; saccades; pursuit; ductions; versions; vergence

Aniseikonia (2 hours)
The effect of unequal retinal image size on binocular vision and space perception

Binocular interaction (2 hours)
Advantages of binocular vision; binocular summation and inhibition; theoretical models

Development of normal binocular vision (2 hours)
Binocular development from infancy to adulthood; the sensitive period; effect of visual deprivation

Ocular transmission and aberrations (3 hours)
Transmission and absorption spectra of the media components; their effects on vision; aberrations of lens systems as applied to the eye; effects of these upon vision

Entoptic phenomena (3 hours)
Physiological visual sensations and their cause and effects

Laboratory work: reinforces lecture material by experimental study such as stereopsis, entoptic phenomena. (12 hours)

Assessment

Coursework 40%
(written assessment and quizzes)

Examination 60%
(2 hours written paper)

Reading List

Prescribed Reading


**Recommended Reading**


Subject Title: Foundation Physiology II  
Code: ABCT217  
Credits: 3  
Level: 2  
Status: Compulsory  
Stage: 1  
Offering Department: ABCT  
Semester: 2

Teaching Pattern

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>34</td>
</tr>
<tr>
<td>Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>Tutorial</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>44</strong></td>
</tr>
</tbody>
</table>

Learning Outcomes

On completion of this subject, the student should be able to:
1. describe the normal functioning of the human body with emphasis on the mode of mechanisms
2. appreciate of the integrative nature in the operation of the different body systems in health and illness
3. explain how different organ systems work together to maintain normal bodily functions
4. acquire an analytical and critical mind through a process of question and problem solving

Outline Syllabus

Digestive system
Immune system
Endocrine system
Reproductive system
Renal system

Indicative Content

Digestive system: Structure of the digestive system; digestion and absorption; regulation of the digestive processes.

Immune system: Classifications of cells of the internal defense system; recognition of self and “non-self”, non-specific defense processes; specific defense processes; roles of antibodies and complement pathways.
Endocrine system: Organization and structure of the endocrine system; classification of hormones; controlling mechanisms of hormone secretion; function of hormones; anatomical and physiological link between the endocrine and nervous systems.

Reproductive system: General principles of gametogenesis; male reproductive physiology; female reproductive physiology; female sex cycle; pregnancy.

Renal system: Organization of the urinogenital system; structure of a typical nephron; basic renal processes; regulation of sodium and water balance; regulation of potassium, calcium and hydrogen ions.

Practical: Measurements of digestive enzyme activities, antibody and antigen reactions in blood.

Tutorials: Exercises in theory-practical integration in the various body systems studied.

Assessment

| Coursework | 50% |
| Examinations | 50% |

Reading List


Subject Title : Foundation Mathematics  
Credits : 3  
Status : Compulsory  
Offering Department: AMA  

Teaching Pattern

Lecture 42 hours

Learning Outcomes

On completion of this subject, the student should be able to:

1. apply mathematical reasoning to analyse essential features of different mathematical problems
2. extend their knowledge of mathematical techniques and adapt known solutions to different situations arising in Optics
3. develop and extrapolate mathematical concepts in synthesizing and solving new problems in Optics
4. search for useful information in solving different mathematical problems in Optometry related topics
5. undertake formulation of mathematical problems through continuous self-learning

Outline Syllabus

Basic mathematics
Differential Calculus
Integral Calculus

Basic mathematics : Trigonometry, Complex numbers, Simple matrices.

Differential Calculus : Differentiation from the first principles, Rates of change, Differentiation of algebraic, trigonometric, logarithmic and exponential functions, Differentiation of inverse functions and implicit functions, Leibniz's theorem, Geometric and physical applications.

Integral Calculus : Definite and indefinite integrals, Techniques of integration, Reduction formulas, Applications of integration.

Assessment

Coursework 40%
Examination 60%
Reading List

Textbooks and Reference Books:


<table>
<thead>
<tr>
<th>Subject Title</th>
<th>Optics 2</th>
<th>Code</th>
<th>AP229</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credits</td>
<td>3</td>
<td>Level</td>
<td>2</td>
</tr>
<tr>
<td>Status</td>
<td>Compulsory</td>
<td>Stage</td>
<td>1</td>
</tr>
<tr>
<td>Offering Department</td>
<td>AP</td>
<td>Semester</td>
<td>2</td>
</tr>
</tbody>
</table>

**Teaching Pattern**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>26 hours</td>
</tr>
<tr>
<td>Laboratory</td>
<td>20 hours</td>
</tr>
<tr>
<td>Tutorial</td>
<td>6 hours</td>
</tr>
</tbody>
</table>

**Learning Outcomes**

On completion of this subject, the student should be able to:
1. solve optical problems
2. describe optical phenomena
3. demonstrate background knowledge of physical and geometrical optics essential for the future study of visual and ophthalmic science

**Outline Syllabus**

Wave nature of light
Production and Measurement of light

**Indicative Content**

Wave nature of light - Fresnel's laws of reflection; optical fibres; interferometry and applications; optical coating; Fresnel and Fraunhofer diffraction; zone plates and their application; resolving power; polarization by reflection, scattering, dichroism and birefringent; applications of polarized light.
(18 hours)

Production and Measurement of light- dual nature of light; black body radiation; atomic spectra; nature and applications of lasers; fundamental laws of photometry; reflectance, transmittance and absorbance; principles and applications of lasers.
(14 hours)

Practical work : experiments on geometrical and physical optics.
(20 hours)
Assessment

Coursework 40%
Examination 60%
(2 hour written paper)

To pass the subject, students must obtain grade D or above in the examination.

Reading List

Prescribed Reading


Recommended Reading

Subject Title : Applied Microbiology
Code : HTI2516
Credits : 2
Level : 2
Status : Compulsory
Stage : 1
Offering Department: HTI
Semester : 2

Teaching Pattern

<table>
<thead>
<tr>
<th>Lecture</th>
<th>24 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory</td>
<td>6 hours</td>
</tr>
<tr>
<td></td>
<td>30 hours</td>
</tr>
</tbody>
</table>

Learning Outcomes

On completion of this subject, the student should be able to:
1. recognize the relationship between host and microorganisms
2. demonstrate microbiological knowledge required for an understanding on the spread and control of ocular infection
3. describe some common ocular infections
4. understand the principles and use of chemotherapeutics
5. demonstrate aseptic precautions necessary for the safe practice of optometry

Outline Syllabus

Introduction to microbiological principles
Characteristics of micro-organisms
Bacterial, fungal and viral pathogens
Parasitism
Spread of micro-organisms and disease
Control of cross infection
Eye infections: an introduction
Chemotherapeutics: an introduction
Biodeterioration
Sterilization and disinfection
Care of optical instruments

Indicative Contents

Introduction; applied microbiology as an aid to diagnosis; specimens required for diagnosis; characteristics of commonly found micro-organisms; differences between bacteria, fungi and viruses
Pathogens; sites and sources of infection; properties of micro-organisms that cause disease; differentiation of commensals from pathogens
Parasitism; relationship between host and parasite and between the characteristics of micro-organisms and their mode of parasitism
(7 hours)
Spread of micro-organism; transmission of disease; infectious disease, epidemic, endemic and carrier; reservoirs of infection and mode of spread; measures to control the spread of infections by controlling transmission, the use of quarantine and vaccination (5 hours)

Eye infections; the aetiologics agents of eye infections; the environment, and the physical chemical defense mechanisms of the eye (4 hours)

Chemotherapeutics; principles and use of commonly used antibiotics; mutation and adaptation of bacteria to antibiotics
Biodeterioration; prevention of biodeterioration; factors influencing the growth of fungi (4 hours)

Care of optical instruments; methods of storage; properties and use of microbiocides (2 hours)

Sterilization; the principles of sterilization and disinfection and the agents commonly used; methods of use of those agents and the reasons for their choice; monitoring of the effectiveness of these procedures (4 hours)

Laboratory work: experiments are incorporated in the subject to enhance the concepts of transmission and control of disease (4 hours)

**Assessment**

<table>
<thead>
<tr>
<th>Coursework</th>
<th>50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1 hour written assessment of 25%, 3 lab reports of 15%, 1 presentation of 10%)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Examination</th>
<th>50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2 hours written paper)</td>
<td></td>
</tr>
</tbody>
</table>

**Reading List**

**Prescribed Reading**

**Recommended Reading**


Block, Seymour, Stanton (Eds). Disinfection, Sterilization and Preservation. Lippincott Williams and Wilkins, Philadelphia 2001
Subject Title : Ophthalmic Optics and Dispensing 1  
Code : SO307

Credits : 3  
Level : 3

Status : Compulsory  
Stage : 2

Offering Department: SO  
Semester : 3

Teaching Pattern

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>27</td>
</tr>
<tr>
<td>Laboratory</td>
<td>20</td>
</tr>
<tr>
<td>Tutorial/Seminar</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>52</td>
</tr>
</tbody>
</table>

Learning Outcomes

On completion of this subject, the student should be able to:
1. apply the paraxial theory to analyze and solve problems related to image characteristics in various optical systems
2. recognize the commonly used units for prism power and inter-converse a prism power between the different units
3. use a focimeter and a lens measure to find the power of a single vision spectacle lens
4. analyze and solve problems related to the optical properties of a single vision spectacle lens
5. state the optical principles of lenticular and Fresnel lenses and recognize their ophthalmic uses
6. select appropriate lens materials for spectacle prescriptions
7. name some commonly used spectacle frame materials and state their properties
8. recognize the major components of a spectacle frame
9. measure basic features of a spectacle frame and related facial parameters for the purposes of lens edging and frame fitting
10. evaluate the optical suitability of a given pair of single vision spectacles
11. perform lens laying-off and edging for single vision spectacles

Outline Syllabus

Vergence method of ray tracing
Basic optic properties of single vision lenses
Ophthalmic lens power and form presentation
Ophthalmic prism and lens decentration
Obliquely crossed cylinders
Accurate transposition
Lens materials and fabrication
Lenticular and Fresnel lenses
Frame material and types
Frame and face measurement
Indicative content

1. Vergence method of ray tracing: Theory, method and applications of tracing paraxial ray through single and complex lens systems. (3 hours)

2. Basic optical properties of single vision lenses: Optical properties of spherical and sphero-cylindrical lenses; principles of focimeter and lens measure. (4 hours)

3. Ophthalmic lens power and form presentation: Lens power and form transposition. Writing of prescriptions and lens shapes presentations. (2 hours)


5. Obliquely crossed cylinders: Effects and calculation of cylinders crossed at any angle. (2 hours)

6. Accurate transposition: Calculation of exact lens forms for thick lenses, with bi-toric surfaces. (3 hours)

7. Lens materials and their fabrication: Optical and physical properties of common ophthalmic lens materials; selection of lens materials. Introduction to processes of lens making. (3 hours)

8. Lenticular and Fresnel lenses: Optical principles and ophthalmic uses of lenticular and Fresnel lenses. (2 hours)

9. Frame materials: Merits of different types of spectacle frame materials; frame types and components parts; effects of frame designs on fitting. (2 hours)

10. Frame and face measurement: Introduction to spectacle frame and face measurement. (3 hours)

11. Laboratory/workshop practice
   Workshop safety; lens measure; thickness caliber; PD and frame measure; lens marking; lens edging; uses of focimeters for single vision lenses and completed spectacles; basic spectacle fitting.

12. Seminar and tutorial
   Feedback on student progress and to provide remediation on a group/individual basis. Discussion of issues related to spectacle fitting/dispensing will be conducted.

Assessment

Coursework 40%

Examination 60%
(2 hour written paper)

Workshop practice will be assessed continuously and by practical tests. Students are required to pass the practical component in order to pass the overall module.
**Reading List**

**Prescribed Reading**


**Recommended Reading**


Subject Title : Clinical Optometry 2
Credits : 3
Status : Compulsory
Offering Department: SO
Students are required to have attended: Clinical Optometry 1 (SO202)
Visual Science 1 (SO207)

Teaching Pattern:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>22</td>
</tr>
<tr>
<td>Laboratory</td>
<td>33</td>
</tr>
<tr>
<td>Tutorial / Seminar</td>
<td>3</td>
</tr>
<tr>
<td>Field work</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>61</td>
</tr>
</tbody>
</table>

Learning Outcomes

Upon completion of this subject, the student should be able to:
1. perform basic optometric procedures
2. demonstrate skills in binocular vision assessment and ocular health assessment
3. analyse data of binocular vision and diagnose types of abnormal binocular conditions
4. diagnose and manage presbyopia optically
5. recognise normal anterior ocular features using a bio-microscope
6. choose and apply different kinds of diagnostic pharmaceutical agents
7. measure and interpret arterial blood pressure and intra-ocular pressure for the evaluation of ocular health
8. take up professional responsibility in the community and appreciate the need to learn continuously in primary eye care

Students are expected to maintain and further develop skills acquired in CO1 using the extra laboratory sessions allocated.

Outline Syllabus

Accommodation and presbyopia
Investigation of binocularity
Slitlamp biomicroscopy
Clinical uses of diagnostic drugs
Intraocular pressure and tonometry
Sphygmomanometry and Ophthalmodynamometry
Indicative Content

Investigation of binocularity: briefly review the theories and principles of binocular visual functions; heterophoria and heterophoric tests - principles and methods; the accommodation-convergence relationship - the AC/A and CA/C ratios; assessment of fusional vergences - methods and normal findings, the vergence-facility test; stereopsis - measurement and clinical applications; the identification of binocular anomalies - nomenclature, analysis of binocular status. (8 hours)

Accommodation and presbyopia: comfortable near vision; the amplitude of accommodation - methods of measurement, effects of age; crossed-cylinder tests of accommodation; relative ranges of accommodation; accommodative facility test; determination of the presbyopic addition. (3 hours)

Slitlamp biomicroscopy: methods and practice of illumination and observation; appearances of normal ocular tissues; clinical applications of biomicroscopy; the use of vital stains. (4 hours)

Clinical uses of diagnostic drugs: Clinical applications of ophthalmic diagnostic drugs – indications, contraindications and precautions for use; evaluation of effectiveness of various preparations; cycloplegic refraction. (3 hours)

Intraocular pressure and tonometry: measurement of intraocular pressure; applanation and indentation tonometry; non-contact tonometry; clinical applications of tonometry in practice. (3 hours)

Sphygmomanometry: principle and method of sphygmomanometry; applications in optometric practice; ophthalmodynamometry – theory and application in optometric practice (1 hour)

Laboratory work: All lectures are augmented by appropriate laboratory work emphasizing the acquisition of basic clinical skills in the methods of optometric examination. Students will be expected to compare, contrast and evaluate examination methods, and to practice the implementation. Laboratory attendance is compulsory.

All students have to actively participate in a 3-hr equivalent project (e.g. vision screening) in the community.

Tutorials: small-group discussions on clinically related topics will take place, e.g. discussion of clinical examination strategies, relationship amongst tests, comparative evaluation of procedures.

Assessment

<table>
<thead>
<tr>
<th>Coursework</th>
<th>60%</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Students must pass the laboratory assessment)</td>
<td></td>
</tr>
<tr>
<td>Examination</td>
<td>40%</td>
</tr>
<tr>
<td>(2 hour written paper)</td>
<td></td>
</tr>
</tbody>
</table>
Reading List

Prescribed Reading

Grosvenor TP. Primary Care Optometry, 4th Ed., Butterworth & Heinemann, 2002

Benjamin WJ. Borish's Clinical Refraction. WB Saunders, Philadelphia. 1998

Elliot DB. Clinical Procedures in Primary Eye Care. 2nd Ed., Butterworth-Heinemann, 2003

Recommended Reading

Subject Title : Visual Science 3        Code : SO313
Credits : 2        Level : 3
Status : Compulsory        Stage : 2
Offering Department: SO        Semester : 3

Students are required to have attended: Anatomy for Optometry (SO206)

Teaching Pattern

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>24</td>
</tr>
<tr>
<td>Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>Tutorial</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>31</strong></td>
</tr>
</tbody>
</table>

Learning Outcomes

On completion of this subject, the student should be able to:
1. recognize the characteristics of retinal integration
2. describe the coding system in visual neuro-processing
3. describe the characteristics of neural organization in the visual system
4. explain the origin and features of the circadian cycle
5. explain and evaluate the importance of light in vision and organisms
6. use of the knowledge of visual science in explanation of clinical cases and real-life examples

Outline Syllabus

Anatomy of the visual pathway - brief revision
Light and the visual system
Retinal integration of visual information
Electrophysiology of the visual system
Neural organization of the visual system in the brain
Coding in the visual system

Indicative Content

Anatomy of the visual pathway : brief review of the nerve fibre distribution in the retina, optic nerve, optic chiasma and optic pathway; visual and synaptic relations in midbrain and cerebrum. (1 hour)

Light and the visual system : introduction to photometry; light as a physiological stimulus, characteristics of light, representation of the visual stimulus on the retina; circadianism and vision. (5 hours)
Retinal integration of visual information: convergent properties of retinal signals in the retina; integration of visual information in the retina in relation to the control of retinal sensitivities. (4 hours)

Electrophysiology of the visual system: the physiological basis of ERG, EOG, and VER to structured and unstructured stimuli. (7 hours)

Neural organization of the visual system in the brain: representation of the visual stimulus on the visual cortex; receptive fields and properties of various cells involved in the visual pathway; relationship between cortical organization and light, form and colour perception, movement and stereopsis. (3 hours)

Coding in the visual system: concept and organization of receptive fields, edge detection, spatial frequency tuning, neural channels. (4 hours)

Laboratory sessions are designed to enhance the concept in luminosity function and visual electrophysiology. (4 hours)

Tutorials will be used to provide remediation for individual students when necessary (3 hours)

Assessment

Coursework 50%
Examination 50%
(2 hour written paper)

Reading List

Prescribed Reading


Recommended Reading


Brain story [videorecording], London : BBC, c2000. episode 1-6 QP376 .B737


Greenfield S. Brain story : unlocking our inner world of emotions, memories, ideas and desires London : BBC, 2000


Subject Title : Applied Statistics and Research
Methodology

Credits : 3
Status : Compulsory
Offering Department: HTI

Teaching Pattern
Lecture 22 hours
Tutorial 11 hours
Self-learning 8 hours
Computer assessment 1 hours

42 hours

Learning Outcomes

On completion of this subject, the student should be able to:
1. show an understanding of the ethical issues which may be encountered in research
2. search the literature from refereed and non-refereed resources
3. critique the scientific resources using critical thinking skills; synthesize the information to generate a coherent description of the particular field of research
4. cite and reference journal papers correctly using appropriate format
5. explain the principles involved in the conception, design, conduct and completion of research projects
6. analyse data using appropriate statistical tests, and correctly interpret and present the results
7. write a structured literature review and identify key issues and gaps in knowledge in the literature

Outline Syllabus

Research ethics
Reviewing and criticising the literature
Structuring a literature review
Generating hypotheses
Experimental design
Describing and displaying quantitative and qualitative data
Choosing and using appropriate statistical tools
Interpreting and reporting the results of statistical tests
## Indicative Content

### A. Research Methodology (24 hours = 14 lecture hours + 10 tutorials)

<table>
<thead>
<tr>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction (2 lec)</td>
</tr>
<tr>
<td>Research ethics</td>
</tr>
<tr>
<td>PolyU Code of Research Ethics</td>
</tr>
<tr>
<td>Plagiarism and its avoidance</td>
</tr>
<tr>
<td>Use of human subjects: ethical considerations; applying for approval (2 lec)</td>
</tr>
<tr>
<td>Critical reading and writing skills</td>
</tr>
<tr>
<td>Sourcing and citing other work and producing reference lists</td>
</tr>
<tr>
<td>Critical evaluation of research papers</td>
</tr>
<tr>
<td>Writing a literature review (10 tut 15/group)</td>
</tr>
<tr>
<td>Generating hypotheses</td>
</tr>
<tr>
<td>Framing the question and defining the Null Hypothesis and the alternative hypothesis</td>
</tr>
<tr>
<td>Probability</td>
</tr>
<tr>
<td>Type I and Type II errors; levels of significance, definition of power; one and two-tailed tests</td>
</tr>
<tr>
<td>Concept of $p$ values</td>
</tr>
<tr>
<td>Experimental design issues</td>
</tr>
<tr>
<td>Control groups</td>
</tr>
<tr>
<td>Prospective vs retrospective designs</td>
</tr>
<tr>
<td>Cross-sectional vs longitudinal designs</td>
</tr>
<tr>
<td>Validity and reliability of data</td>
</tr>
<tr>
<td>Repeated measures</td>
</tr>
<tr>
<td>Sampling</td>
</tr>
<tr>
<td>Populations and random samples:</td>
</tr>
<tr>
<td>Use of different sampling methods: systematic, stratified and cluster sampling</td>
</tr>
<tr>
<td>Surveys</td>
</tr>
<tr>
<td>Instrument validity, Likert scales, designing questionnaires, qualitative analysis (10 lec)</td>
</tr>
</tbody>
</table>

### B. Applied Statistics in Research (18 hours)

Types of data and measurement scales: interval and ratio scales. 
Description and display of data. 
Characteristics of a normal distribution. 
Sampling distribution of the mean and standard error, degree of freedom. 
Estimation of population mean and confidence limits. 
Sample size consideration. 
Parametric and nonparametric tests: Student’s T-test; Wilcoxon test, Mann-Whitney test, Kruskal Wallis test. 
Linear regression and correlation. 
Chi-square test. (8 lec)
Computer work - self-learning package on elementary data analysis. Students will be required to consult a nominated tutor as they work through the package.

Introduction to Instat
Data entry; running tests; interpretation of test results; reporting findings.
Choosing appropriate statistical tests
Comparing a group with a standard group; comparing two groups, comparing more than two groups
Testing relationship
Testing association
Testing agreement
Basic sample size calculations

Assessment
Assessment is 100% coursework
[Both elements of the assessment must be completed successfully].

(a) An assessment of ability to select, use and interpret results from an appropriate statistical tests [0.5]
(b) A fully referenced literature review [~1,500 words] on a selected topic [0.5]

Reading List


Subject Title: Psychology in Health Care  
Code: SN3401

Credits: 3  
Level: 2

Status: Compulsory  
Stage: 2

Offering Department: SN  
Semester: 3

Teaching Pattern

<table>
<thead>
<tr>
<th>Lecture</th>
<th>21 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tutorial/PBL</td>
<td>21 hours</td>
</tr>
</tbody>
</table>

Total: 42 hours

Learning Outcomes

On completion of the subject, the student should be able to:
1. apply their worldviews in understanding the reality as well as human behaviours
2. identify the different conceptual approaches to human behavior
3. identify the major development stages of the life span and recognize the specific issues associated with the different stages
4. describe the major psychological phenomena and relate how these take place within themselves and others; particularly perception, learning, motivation and emotions
5. apply communication and interpersonal skills
6. explain the dynamics associated with group settings and fostering of greater group efficiency

Outline Syllabus

1. Conceptual approaches to behavioural studies
   The major conceptual approaches to investigating human behavior will be presented. These include the behavioural, psychoanalytical, humanistic, cognitive and biological paradigms.
2. Developmental issues across the life span
   This section will cover the major stages in human development and particular issues that are encountered within these stages. Issues will be presented in respect to difficulties encountered by health care clients/hospital patients of different age groups.
3. Psychological functioning
   The major psychological phenomena will be presented. These include: perception, learning, motivation, emotions, as well as health and illness behaviors.
4. Communication and interpersonal skills
   This section will deal with the development of communication and interpersonal skills and time management.
5. Fundamentals of group dynamics
   An introduction to the dynamics of group interactions will be given with an emphasis on issues that hinder or enhance the effectiveness of group work.
6. **Diagnosis, assessment and treatment of dyslexic children.** (Optometry students) 6 Hrs.

7. **Patients needs and management** (Radiography students) 6 Hrs.
   Terminally ill patients: pain, dying and death, grief. Managing potentially stigmatized patients.

**Assessment**

Continuous Assessment 100%
Breakdown:
- Individual Assignment 40%
- Weekly tutorial record mark x 12 30%
- Multiple Choice Test (30 items) 30%

**Reading List**

**Indicative reading**
(indicative means you can replace these with similar up to date books!)


and:


Also:

http://www.apa.org/

http://www.bps.org.uk/index.cfm

PsycINFO (1887+) in HKPU library, electronic resources, then data bases, then indexes & abstracts

E journals in HKPU library, electronic resources, then e-journals. Type ‘psychology’ and click ‘Go’
Subject Title : Clinical Optometry 3
Code : SO310
Credits : 3
Level : 3
Status : Compulsory
Stage : 2
Offering Department: SO
Semester : 4

Students are required to have attended: Clinical Optometry 2 (SO308)
Visual Science 2 (SO315)

Teaching Pattern

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>20</td>
</tr>
<tr>
<td>Laboratory</td>
<td>33</td>
</tr>
<tr>
<td>Tutorial</td>
<td>3</td>
</tr>
<tr>
<td>Field work</td>
<td>3</td>
</tr>
<tr>
<td>Sum</td>
<td>59</td>
</tr>
</tbody>
</table>

Learning Outcomes

On completion of this subject, the student should be able to:
1. describe the principle and evaluate the effectiveness of the advanced ocular health assessment procedures
2. conduct and apply basic and advanced ocular health assessment techniques competently
3. apply these techniques as indicated in the ocular health assessment and recognise pathological changes of the fundus and anterior angle
4. demonstrate skills in sampling and analysing clinical data for making appropriate tentative/final diagnosis on ocular health
5. integrate information from various clinical findings and come out with tentative/final diagnosis and proposed optometric management plans
6. demonstrate ethical, caring and professional attitude in performing clinical assessment

Outline Syllabus

Direct ophthalmoscopy
Indirect ophthalmoscopy
Fundus biomicroscopy
Gonioscopy
Visual fields and visual field tests
Macular functions
Contrast Sensitivity Function
Colour vision
Photo-documentation
Indicative Content

Direct ophthalmoscopy: basic aspects; the appearance of the normal fundus and its variations; an introduction to the ophthalmoscopic signs of ocular disease; clinical practice of ophthalmoscopy. (3 hours)

Indirect ophthalmoscopy: Principles of indirect ophthalmoscopy; monocular indirect and binocular indirect ophthalmoscopy – instrumentation and clinical procedures; appearance of the normal fundus; abnormal changes; clinical applications of techniques. (2 hours)

Fundus biomicroscopy: Contact fundus lenses; the Hruby and Volk lenses and their principles and applications in clinical practice; fundus appearances with biomicroscopy. (2 hours).

Gonioscopy: Principles of methods; types of goniolenses, their methods of application; the appearance of the anterior angle by gonioscopy; abnormal signs in the anterior angle; three-mirror retinal evaluation. (2 hours)

Visual fields and visual field tests: Bjerrum screen; visual field screeners; principles and practice; perimetry – static and kinetic perimetry; automated perimetry; detection of visual field defects. (5 hours)

Macular functions: Various techniques to assess the integrity and functionality of the macula, including the use of Amsler Grid, the photostress test, the neutral-density filter test, the colour comparison test and the brightness comparison test. (2 hours)

Contrast Sensitivity Function: Theory and clinical use of contrast sensitivity function, contrast sensitivity function curve, commercially available contrast sensitivity charts and systems; clinical significance and interpretations of contrast sensitivity function. (1 hour)

Colour vision and colour vision tests: clinical assessment of colour vision; applications of colour vision tests; congenital vs. acquired colour vision defects; clinical manifestations of acquired colour vision defects. (2 hours)

Photo-documentation: methods of ocular photography – anterior eye and fundus. (1 hour)

Laboratory work: All lectures are augmented by appropriate laboratory work emphasizing the acquisition of basic clinical skills in the methods of optometric examination. Students will be expected to compare, contrast and evaluate examination methods, and to practice the implementation. Laboratory attendance is compulsory.

All students have to actively participate in a 3-hr equivalent project (e.g. vision screening) in the community.

Tutorials: small-group discussions on clinically related topics will take place, e.g. discussion of clinical examination strategies, relationship amongst tests, and comparative evaluation of procedures.

Assessment

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coursework</td>
<td>60%</td>
</tr>
<tr>
<td>Examination</td>
<td>40%</td>
</tr>
</tbody>
</table>

(Students must pass the laboratory assessment)
Reading List

Prescribed Reading
Grosvenor TP. Primary Care Optometry, 4th Ed., Butterworth & Heinemann, 2002

Recommended Reading
Amos JF (ed) Diagnosis and Management in Vision Care, Butterworths, Singapore. 1987
Benjamin WJ. Borish’s Clinical Refraction. WB Saunders, Philadelphia. 1998
Subject Title: Ophthalmic Optics and Dispensing 2  
Code: SO311  
Credits: 3  
Level: 3  
Status: Compulsory  
Stage: 2  
Offering Department: SO  
Semester: 4

Students are required to have attended: Ophthalmic Optics and Dispensing 1 (SO307)

Teaching Pattern

Lecture: 26 hours  
Laboratory: 20 hours  
Tutorial/Seminar: 6 hours

52 hours

Learning Outcomes

On completion of this subject, the student should be able to:
1. analyze and solve problems related to the effects of lens effectivity for accommodation demands, differential cylinders and prisms
2. discuss, with appropriate terminology, the optical principles of bifocal, trifocal and multifocal lenses
3. measure related parameters and perform fitting of bifocal, trifocal and multifocal lenses to maximize vision efficiency and wearing comfort
4. discuss the parameters related to spectacle lens design
5. assess the image quality of a lens with given calculated lens design data
6. discuss and make appropriate recommendations for uses of tinted ophthalmic lenses
7. recognize the factors and calculate the lens edge/centre thickness in an edged lens
8. adjust spectacle frames for proper fitting and give appropriate instruction in the safety and efficient use of spectacles
9. evaluate the optical and fitting suitability of a given pair of spectacles
10. perform lens laying-off and edging for bifocal and multifocal spectacles

Outline Syllabus

Bifocals and trifocals  
Multifocals  
Lens thickness considerations and calculations  
Lens effectivity  
Spectacle lens design  
Tinted lenses  
Spectacle fitting
Indicative Content

Bifocals and trifocals: principle and terminology, optical properties and fitting of bifocals and trifocals. (3 hours)

Multifocals: principle and terminology, optical properties and fitting of multifocals. (3 hours)

Lens thickness considerations and calculations: calculation of thickness in edged lenses. (2 hours)

Lens effectivity: Effects of working distance and vertex distance on the prismatic and refractive powers in spectacles. (4 hours)

Spectacle lens design: Introduction to the principles and methods of ophthalmic lens designs. (6 hours)

Tinted lenses: Radiation and the eye; ophthalmic uses of tinted/photochromatic lenses. (3 hours)

Spectacle fitting: Factors to be considered in lens and frame selections. Principles and practical aspects of spectacle frame fitting. (5 hours)

Laboratory/workshop practice:
Measure bifocals, trifocals and varifocals with a focimeter. Marking and edging of bifocals, trifocals and varifocal lenses. Knowledge on common lens types in Hong Kong. Lens and frame selection and spectacle fitting.

Seminar and tutorial
Feedback on student progress and to provide remediation on a group/individual basis. Discussion of issues related to spectacle fitting/dispensing will be conducted.

Assessment

Coursework 40%
Examination 60%
(2 hour written paper)

Workshop practice will be assessed continuously and by practical tests. Students are required to pass the practical component in order to pass the overall subject.

Reading List

Prescribed Reading


Recommended Reading


<table>
<thead>
<tr>
<th>Subject Title</th>
<th>Visual Science 4</th>
<th>Code</th>
<th>SO314</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credits</td>
<td>3</td>
<td>Level</td>
<td>3</td>
</tr>
<tr>
<td>Status</td>
<td>Compulsory</td>
<td>Stage</td>
<td>2</td>
</tr>
<tr>
<td>Offering Department</td>
<td>SO</td>
<td>Semester</td>
<td>4</td>
</tr>
<tr>
<td>Students are required to have attended</td>
<td>Anatomy for Optometry (SO206)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Teaching Pattern

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>28</td>
</tr>
<tr>
<td>Laboratory</td>
<td>18</td>
</tr>
<tr>
<td>Tutorial</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>51</strong></td>
</tr>
</tbody>
</table>

### Learning Outcomes

On completion of this subject, the student should be able to:

1. describe the psychophysical method in vision research
2. explain the mechanisms and analyze the findings of spatial vision
3. explain the mechanisms and analyze the findings of temporal vision
4. explain the principles of colour vision and describe applications of colorimetry
5. use of the knowledge of visual science in explanation of clinical cases and real-life examples

### Outline Syllabus

- Psychophysics of measurement
- Spatial vision
- Temporal vision
- Introduction to Colorimetry
- Visual perception

### Indicative Content

Psychophysics of measurement: frequency of seeing, signal detection theory, ROC curves, visual threshold, signal and noise, criterion-dependent and criterion-independent methods (4 hours)

Spatial vision: spatial resolution, spatial contrast sensitivity, spatial orientation, spatial localisation, hyperacuities (4 hours)

Temporal vision: temporal resolution and flicker, de Lange curve, spatio-temporal characteristics of vision (6 hours)
Colour vision: spectral sensitivity, wavelength discrimination, colour matching, colour contrast, defective colour perception, classical and recent theories of colour vision, design of colour vision tests (8 hours)

Visual perception: sensation and perception, theories of perception, perception of space, form and motion, constancies, factors affecting perception (6 hours)

Laboratory work is designed to reinforce aspects of the syllabus experimentally in neural functions, brightness discrimination, spatial resolution, temporal functions, dark adaptation, and colour vision. (18 hours)

Tutorials will be used to provide remediation for individual students when necessary (5 hours)

Assessment

Coursework 50%
Examination 50%
(2 hour written paper)

Reading List

Prescribed Reading


Recommended Reading


Subject Title: Putonghua for Optometry       Code: CLC216
Credits: 2            Level: 2
Status: Compulsory       Stage: 2
Offering Department: CLC       Semester: 4

Teaching Pattern
Seminar: 28 hours

Learning Outcomes
On completion of this subject, the student should be able to:
1. use the key features of Putonghua in terms of pronunciation and common ways of expression
2. communicate efficiently in Putonghua with accuracy and fluency
3. perform a series of communicative tasks in the professional context with special reference to optometry
4. adopt appropriate pragmatic devices underlying communication tasks in optometry
5. describe the social and cultural background of China as reflected in daily communications in the Chinese mainland

Indicative Content
1. Comprehensive revision on Putonghua communication skills
   • pronunciation
   • vocabularies and grammar
   • colloquial expressions
   • speaking skills and social norms
2. In-depth practice on Putonghua listening comprehension skills
   • speed and accent
   • casual speech vs. speech on specialized topics
   • quantity and structure of information
   • pragmatics rules and implications
3. Professional communication
   • principles and rules in conversation
   • stylistic and rhetorical variations in spoken communications in accordance to contextual changes
   • communicative tasks in the optometry setting: inquiring, introducing, giving instruction, explaining, interviewing, etc.
   • commonly used jargons for optometry
Assessment

Continuous Assessment 100%

Coursework (60%)
Term-end test (40%)

Reading List

Required

Teaching material to be compiled by the Chinese Language Centre with input from Department of Optometry.

Reference

陳建民編著（1998），《普通話常用口語詞和句》，香港：香港普通話研習社。
《現代漢語詞典（增補本）》（2000），北京：商務印書館。
Subject Title : English in the Workplace for Optometry     Code : ELC3605
Credits : 2        Level : 3
Status : Compulsory        Stage : 2
Offering Department: ELC        Semester : 4

Teaching Pattern
Seminar         42 hours

Learning Outcomes

On completion of this subject, the student should be able to:
1. write workplace correspondence related to referrals
2. write reports related to optometry studies and clinical cases
3. present information and ideas in workplace presentations

Outline Syllabuses

This syllabus is indicative. The balance of the components, and the weighting accorded to each will be based on the specific needs of the students.

1. Language appropriacy: introducing notions of context-sensitive language use in both spoken and written English; for example, writing e-mails and using the telephone.

2. Seeking and supplying information: practice in the oral skills required in fact-finding and job-seeking interviews, problem-solving negotiations, and conducting questionnaire surveys.

3. Workplace writing: selecting and using relevant content; appropriate style; acceptable format; structure and layout, in letters, memoranda, reports, notices for public display, proposals, presentation notes, forms and questionnaires.

4. Language development: improving and extending relevant features of students’ grammar, vocabulary and pronunciation.

Throughout this subject, continuing attention will be paid to grammar, vocabulary and pronunciation.
Indicative Content

The subject is designed to introduce students to the kinds of communication skills both oral and written that they may be expected to need in their future professions. These skills will be necessary for successful employment in any company/organisation where internal and/or external communication is conducted in English.

The study method is primarily based on seminars. These will include discussions, role-play, individual and group activities. Use will be made of video and tape recordings, library research, and our Centre for Independent Language Learning. Students in need of additional help will be required to attend a supplementary English programme organised by the English Language Centre.

Assessment

Continuous Assessment 100%

Reading List

General


Grammar, vocabulary and style

Learning and Teaching Materials

English in the Workplace published by the English Language Centre, the Hong Kong Polytechnic University and specially prepared material from the Centre will be used throughout the course. In addition, teachers will recommend additional reference materials as required.
Subject Title : Foundation Pathology
Code : HTI256
Credits : 3
Level : 2
Status : Compulsory
Stage : 2
Offering Department: HTI
Semester : 4

Students are required to have attended: Generic Anatomy (HSS201)

Teaching Pattern

Lecture 28 hours
Laboratory 9 hours
Tutorial 6 hours

43 hours

Learning Outcomes

On completion of this subject, the student should be able to:
1. use descriptive terminology to describe the pathophysiology of selected diseases
2. explain the principle of diseases with respect to histopathology
3. correlate macroscopic, microscopic and diagnostic imaging in disease processes

Outline Syllabus

Principle of diseases
   Introduction to the study of the patterns, causes, mechanisms and effects of diseases
   Cellular adaptive responses to injury and in disease
   Tissue responses to microbial infections
   Immune, infective, environmental and nutritional factors in disease
   Neoplasia
   Molecular mechanisms in cell proliferation and necrosis

Pathology topics in Hong Kong
   Selected topics relevant to the prevalence of disease in the local area will be discussed in terms of the mode of disease pattern, causes, mechanisms, effects and complications.

Indicative Content

Introduction to principles of diseases and basic histopathology (2 hours)
Cell responses and injury (2 hours)
Acute inflammation and pneumonia (2 hours)
Chronic inflammation and tuberculosis (2 hours)
Viral infections and human diseases (2 hours)
Microbial infections in human diseases (2 hours)
Peptic ulceration and stomach cancer (2 hours)
Introduction to neoplasia (2 hours)
Lung cancer and nasopharyngeal carcinoma (2 hours)
Acquired Immune Deficiency Syndrome (2 hours)
Hepatitis, liver cirrhosis, liver cancer (4 hours)
Peripheral vascular diseases (2 hours)
Intracranial expanding lesions (2 hours)

Lecture and laboratory sessions: lecture materials are delivered by power-point presentations and laboratory sessions are conducted with microscopic set-ups, museum specimens and imaging case studies that serve to enhance student’s understanding.

Assessment

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coursework</td>
<td>40%</td>
</tr>
<tr>
<td>Examination</td>
<td>60%</td>
</tr>
<tr>
<td>(2 hours written paper)</td>
<td></td>
</tr>
</tbody>
</table>

Reading List

Prescribed Reading


Recommended Reading

Ho FCS, Wu PC. Topics in pathology for Hong Kong. Hong Kong University Press, 1995
Subject Title : Clinical Binocular Vision  
Code : SO415  
Credits : 3  
Level : 4  
Status : Compulsory  
Stage : 3  
Offering Department: SO  
Semester : 5

Students are required to have attended: Visual Science 2 (SO315)

Teaching Pattern

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>28</td>
</tr>
<tr>
<td>Laboratory</td>
<td>10</td>
</tr>
<tr>
<td>Tutorial/Seminar</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>48</strong></td>
</tr>
</tbody>
</table>

Learning Outcomes

On completion of this subject, the student should be able to:
1. identify different types of binocular vision anomalies  
2. discuss the sensory adaptations in binocular vision anomalies  
3. investigate the presence of any sensory and motor adaptations  
4. describe the different methods of vision therapy  
5. apply vision therapy for a particular binocular vision anomaly  
6. evaluate the prognosis for a particular binocular vision anomaly  
7. apply and critique different strategies for managing binocular vision anomalies

Outline Syllabus

Vision therapy concepts  
Heterophoria and its management  
Accommodation and convergence anomalies  
Heterotropia  
Sensory adaptations  
Comitant strabismus  
Incomitant strabismus  
Management of strabismus  
Nystagmus

Indicative Content

Vision therapy procedures and instrumentation: synoptophore, synoptoscope, stereoscopes, anaglyphs, physiological diplopia techniques and their application.  
(4 hours)
Heterophoria: aetiology and classification; clinical signs and symptomology; compensation and decompensation; factors affecting compensation; investigation of compensation; fixation disparity; management of heterophoria problems - effect of the refractive correction, visual therapy and prismatic therapy, prognosis.

Accommodation and convergence anomalies: accommodation and convergence excess and insufficiency, investigation and management.
(6 hours)

Heterotropia: aetiology and classification; comitance and incomitance.

Sensory adaptations: development of sensory adaptations in strabismus; amblyopia, eccentric fixation, anomalous correspondence, suppression - clinical signs and investigations.

Management of comitant strabismus and sensory adaptations: occlusion therapy, pleoptics, antisuppression training, restoration of normal correspondence; training the motor angle of strabismus; selection of cases for treatment and prognosis; pre and post surgical orthoptics; role of the refractive correction and prisms.

Management of incomitant strabismus: development of motor adaptations; clinical signs and investigations; indications for referral; optometric management.
(16 hours)

Nystagmus: latent and manifest nystagmus; forms of nystagmus, clinical investigation and significance; optometric management.
(2 hours)

Laboratory work: to introduce techniques and instruments applicable to the investigation and management of strabismus, vision therapy techniques; "real" patients may be brought in for demonstration of clinical techniques from time to time.

Seminars: Student-led discussions on the relative merits of treatment strategies for patients with binocular anomalies. These will relate to the lecture material, student background reading and case analysis from clinic records.

Assessment

Coursework 40%
Examination 60%
(2 hour written paper)

Reading List

Prescribed Reading


Recommended Reading

Caloroso EE, Rouse MW. Clinical management of strabismus, Butterworth-Heinemann, 1993


Subject Title : Contact Lens Practice  
Code : SO423
Credits : 6  
Level : 4
Status : Compulsory  
Stage : 3
Offering Department: SO  
Seminesters : 5 & 6

Students are required to have attended:  
Ocular Physiology (SO209)
Visual Science 2 (SO315)
Ophthalmic Optics & Dispensing 2 (SO311)

Teaching Pattern

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>50 hours</td>
</tr>
<tr>
<td>Laboratory</td>
<td>50 hours</td>
</tr>
<tr>
<td>Tutorial</td>
<td>10 hours</td>
</tr>
</tbody>
</table>

110 hours

Learning Outcomes

On completion of this subject, the student will demonstrate knowledge and understanding with respect to the prescription and usage of contact lenses, particularly, the ability to
1. assess/measure corneal integrity/parameters with the slit lamp and keratometer
2. assess and characteristics of the tears
3. diagnose/interpret information from assessments made in 1 & 2
4. explain the roles of blinking, tears and the cornea, and the effect of contact lens wear
5. identify and explain factors affecting contact lens wear and the performance of rigid lens on the eye
6. explain the indications and contraindications of contact lens wear
7. make comparison between different (major) types of lens material with respect to their advantages, disadvantages, indications and contraindications
8. explain the function/effect of lens parameter on lens fitting, and verify the main parameters
9. recommend and justify recommendations of appropriate types of contact lenses for vision correction, including astigmatism, presbyopia, extended wear, keratoconus, and for cosmetic reasons
10. diagnose common contact lens-related problems and synthesize information learned to develop appropriate management protocols
11. communicate clearly the purposes and procedures of each type of contact lens consultations, including instructions and procedures related to lens handling, care and wear
12. reflect and analyse contact lens cases, via case analysis.

64
Outline Syllabus

Corneal shape and measurements
Corneal physiology and lens wear
Solutions and stains
Soft lenses
Complications of contact lens wear – ocular & lens (deposits)
Contact lens consultations
Lens verification
Properties of contact lens materials
Optics
Rigid and gas permeable rigid lenses fitting
Astigmatism and contact lenses
Extended wear lenses
Cosmetic contact lenses
Contact lenses for presbyopes and keratoconus

Indicative Content

Topics

Introduction to contact lenses, indications and contra-indications for contact lens wear (2 hours)

Cornea, corneal shape (topography) and the use of the keratometer in contact lens practice; sources of error; contact lens terms (3 hours)
Optical pachometry (lab only)

Rigid contact lens materials; oxygen permeability and transmissibility; wettability; water absorption (1 hour)

The tear film and blinking: effects of normal blinking on lens wear, tear exchange and lens rotation; abnormal blink patterns and their effects; and the effect of lens wear on the tear film; tear function tests and their significance (2 hours)

Solutions and stains: preservatives used in contact lens solutions; solutions necessary for the care of all types of contact lenses; use of stains in contact lens practice; sodium fluorescein (4 hours)

Soft lenses: lens designs; specific indications and contraindications; fitting principles and assessment of fit; effect of altering parameters; optimum fitting criteria (4 hours)

Management of contact lens complications:
  • contact lens spoilage and preventative measures (2 hours)
  • ocular complications: signs, symptoms, etiology, treatment and prognosis (6 hours)

Consultations: functions and procedures
  • Preliminary, fitting and delivery visits (2 hours)
  • Aftercare routines (stress on slit lamp examination) (2 hours)
Verification: measuring BOZR and other radii, diameters, thickness, back vertex power; measuring water content; examining edges and surfaces (lab only)

Optics of contact lenses: the tear/cornea lens system; residual astigmatism; magnification and accommodation with contact lenses and their implications (2 hours)

Rigid lens fitting philosophies and designs; fluorescein patterns; common fitting techniques; forces acting on the lens/eye (4 hours)

Gas permeable rigid lenses: objectives; specific indications and contraindications; trial sets and initial lens selection; fluorescein pattern; assessment of lens fit; over-refraction; the effect of altering parameters; optimum fitting criteria (6 hours)

Astigmatism and contact lenses: RGP and soft toric lenses (4 hours)

Extended wear and disposable lenses: patient selection and management; fitting philosophies, soft versus RGP; management (2 hours)

Lenses for presbyopic and keratoconus patients; cosmetic contact lenses (4 hours)

Laboratory work

Laboratory sessions function as a preliminary to contact lens clinical practice for the development of knowledge and skills in slit lamp biomicroscopy, keratometry, tear function tests, soft/rigid lens handling, verification, insertion, removal, fitting assessment, and examination routines applicable to contact lens practice.

Tutorials

Areas of weakness, as identified through continuous assessment or by the students themselves, will be dealt with in tutorials. Case studies will be used to bridge theory and practice. Work will be on a class, small group or one-to-one basis as required. Group discussion and contributions will be encouraged.

Sit-in Contact Lens Clinic

To help students prepare for CLC in their final year, CLC sit-in will be arranged.

Assessment

<table>
<thead>
<tr>
<th>Component</th>
<th>Weightage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coursework</td>
<td>70%</td>
</tr>
<tr>
<td>Examination</td>
<td>30%</td>
</tr>
<tr>
<td>(3-hr written paper)</td>
<td></td>
</tr>
</tbody>
</table>

To pass the subject, the student has to pass both Final Examination and Coursework. To pass coursework, the student has to obtain a passing mark and pass the practical test.
Reading List

Prescribed Reading


Recommended Reading


Subject Title: Optometry Specialisms  
Code: SO425  
Credits: 3  
Level: 4  
Status: Compulsory  
Stage: 3  
Offering Department: SO  
Semester: 5  

Teaching Pattern

Lecture: 34 hours  
Laboratory: 12 hours  
Field Study: 9 hours  

Total: 55 hours  

Learning Outcomes

On completion of this subject, the student should be able to:
1. describe the development and the effects of age on the visual system and visual function
2. identify the normal visual development in young children and to differentiate from the premature and special need population
3. recognize the problems faced by the geriatric and low vision clients and the importance of being a caring and listening practitioner
4. differentiate the pathological and the non-pathological visual or ocular changes in geriatric population as to formulate management plans for the common ocular problems in this population
5. demonstrate and apply specific knowledge in the investigation, evaluation and management of paediatric, geriatric and low vision patients
6. identify and differentiate clients who require basic low vision services, advanced low vision services and referral services

Outline Syllabus

Paediatric Optometry
Visual and refractive development and norms
Clinical examination of children
Management of visual problems in children

Low Vision
Visual impairment defined
Examination of the low vision patient
Optical aspects of low vision aids

Prescription techniques of low vision aids
Management of low vision patients
Low vision services in Hong Kong
Recent research

68
Geriatric Optometry
Anatomic and physiologic change with age
Changes in visual functions with age
Examining the aging patient
Aphakia and pseudophakos
The housebound or bedridden patient

Indicative Content

Paediatric Optometry

Refractive norms and measuring refractive error in infants and young children
Norms and measurement of visual acuity and other visual parameters
Genetic and environmental factors in myopia
Vision and learning problems
Management of visual problems in children (case studies)
(10 hours)

Low Vision

Visual impairment defined: legal, medical and social definitions; prevalence and incidence; causes of visual impairment

Examination of the low vision patient: visual acuity assessment; clinical expectations of visual acuity; refraction and the refractive correction; other investigations including visual field and contrast sensitivity

Magnification and low vision aids: principles of magnification; optical principles of magnifiers and telescopic aids; types of low vision aids available; clinical assessment of low vision aids; training and applications of low vision aids
(8 hours)

Management of low vision patients: the multi-disciplinary approach; rehabilitation services; the optometrist in the multi-disciplinary team

Low vision services in Hong Kong: current services; future planning and projection

Recent research: clinical applications of recent research into low vision causes and management
(4 hours)

Geriatric Optometry

Anatomic and physiologic change with age: changes in ocular structure with particular reference to retina and lens; development of cataract and age-related maculopathy; clinical implications of age related changes

Changes in visual functions with age: effects upon visual acuity, colour vision, adaptation, contrast sensitivity, visual field; changes in binocularity
(6 hours)
Examining the aging patient: effects of common systemic and ocular diseases; aims and goals of the examination; amendments to routine to account for change in visual function

Aphakia and pseudophakos: advantages and disadvantages of aphakic corrections; types of aphakic correction; problems of the newly corrected aphake; the pseudophakic eye post operatively; types of pseudophakic correction; complications of pseudophakos

The housebound or bedridden patient: optometric examination; role of the optometrist in institutional care; domiciliary visits (6 hours)

Laboratory work: demonstration of the different tests used in paediatric patient examination; the simulation of various low vision conditions, and the prescription and evaluation of distance and near aids; mobility requirements for the visually handicapped (12 hours)

In addition to laboratory work, 3 field trips will be taken to the Hong Kong Society for the Blind and the Ebenezeer School for the Blind (9 hours)

Paediatric and senior patients will be seen in the Optometry Clinic in semesters 7/8.

Assessment

<table>
<thead>
<tr>
<th>Coursework</th>
<th>40%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examination</td>
<td>60%</td>
</tr>
<tr>
<td></td>
<td>(3 hour written paper)</td>
</tr>
</tbody>
</table>

Reading List

Prescribed Reading


Recommended Reading


Weale RA. A Biography of the Eye, H.K. Lewis, 1982

Amos J.(ed). Diagnosis and Management in Vision Care, Butterworths, 1987


Subject Title : Ocular Pathology       Code : SO434
Credits : 4       Level : 4
Status : Compulsory       Stage : 3
Offering Department: SO       Semester : 5

Students are required to have attended: Anatomy for Optometry (SO206)

Teaching Pattern

Lecture 54 hours

Learning Outcomes

On completion of this subject, students should be able to:
1. describe the signs and symptoms of primary and secondary eye disease encountered in clinical practice
2. analyse the clinical findings to make appropriate diagnosis
3. take appropriate action when ocular disease is recognised
4. perform ocular first aid and manage ocular emergencies
5. apply latest research findings on the diagnosis and management of ocular diseases

Outline Syllabus

Diseases of the eyelids and the lacrimal system
Conditions of the orbit and orbital structures
Corneal and conjunctival problems
Diseases of the sclera and uveal tract
Crystalline lens and cataract
Diseases of the vitreous and retina
Glaucoma
Ocular signs of systemic diseases
Ocular injury and trauma
Neuro-ophthalmology
Clinical aspects of ultrasound, CT and MRI
Conditions requiring immediate referral
Refractive surgery

Indicative Content

Eyelids/lacrimal system: signs and symptoms of inflammation, trauma, and degeneration; differential diagnosis of congenital anomalies; optometric action
Orbit: congenital and developmental anomalies; signs and symptoms of inflammatory and toxic conditions; signs and symptoms of orbital trauma.
Proptosis. Tumours affecting the eyes and ocular adnexae.
(6 hours)
Anterior segment: congenital anomalies of the anterior segment; inflammatory and toxic conditions; degenerative and dystrophic conditions; differential diagnosis of the red eye; optometric management
Uveal tract: differential diagnosis of uveitis; complications and secondary effects; atrophic and degenerative changes; related neoplasm; optometric management
(12 hours)

Crystalline lens: differential diagnosis of lenticular anomalies; signs and symptoms of cataract; senile cataract; secondary cataract; complications and management; optometric management
Vitreous and retina: vascular anomalies; inflammatory conditions; retinal detachment; degeneration and dystrophies; laser and cryotherapy treatment; congenital and developmental conditions; trauma and foreign bodies; optometric involvement
(12 hours)

Glaucoma: definition and incidence; review of aqueous physiology and angle anatomy; signs, symptoms and investigative techniques; secondary glaucoma; suggested criteria for referral
(6 hours)

Headaches. Decrease in visual acuity of acute and chronic onsets.
Ocular manifestations of systemic disease - signs and symptoms; optometric management
Ocular injury - definition; ocular first aid; optometric management
(6 hours)

Neuro-ophthalmology - review of anatomy, physiology, and retinotopic visual field organisation; symptoms, and investigative techniques of visual field loss: signs and symptoms of optic nerve disease; pupillary pathway; pupillary tests; congenital and developmental pupillary anomalies; differential diagnosis of pupillary defects; neuroophthalmic signs of AIDS
Ultrasound, computerised tomography and magnetic resonance imaging: clinical application; differential diagnosis; investigative techniques
Immediate referral: recognition of conditions requiring immediate referral; necessary action
(8 hours)

Different techniques in refractive surgery. Complications and management of post-refractive surgery
(2 hours)

Assessment

Coursework 40% (written assessments and quizzes)
Examination 60% (3 hours written paper)
Reading List

Prescribed Reading


Recommended Reading
Alexander LJ. Primary Care of the Posterior Segment. 2nd ed. 1994 Appleton & Lange.


Subject Title : Clinical Optometry 4  
Code : SO443
Credits : 3  
Level : 4
Status : Compulsory  
Stage : 3
Offering Department: SO  
Semester : 5

Students are required to have attended: Clinical Optometry 3 (SO310)  
Visual Science 4 (SO314)

Teaching Pattern

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>21</td>
</tr>
<tr>
<td>Laboratory</td>
<td>36</td>
</tr>
<tr>
<td>Tutorial</td>
<td>4</td>
</tr>
</tbody>
</table>

Total: 58 hours

Learning Outcomes

On completion of this subject, the student should be able to:
1. explain the principles and evaluate the effectiveness of specialized and advanced optometric investigations
2. conduct specialized and advanced optometric investigations competently
3. demonstrate the ability to select appropriate specialized and advanced procedures for assessment as indicated in the optometric examination
4. take comprehensive patient history, devise working hypothesis and formulate tests to evaluate clinical symptoms
5. integrate and synthesize clinical findings/information and come up with correct tentative and final clinical diagnosis with management plans
6. prescribe appropriate correction per refractive and non-refractive conditions and give suitable management plan
7. commit in the role of optometrist as a primary eye care provider, able to diagnose and treat, and able to interact professionally in inter and intra-profession communication

Outline Syllabus

Electrophysiology
Ultrasonography and other imaging technique
Case history taking and symptomatology and headache
Advanced Optometric Investigation
Prescription decisions
Clinical case management
Inter- and intra-profession communication
Indicative Content

Electrophysiology: principles and applications of visual electrophysiological techniques in optometric practice. (2 hours)

Ultrasonography and other imaging techniques: Principles and applications of A-scan, B-scan and ultrasound Pachymetry in clinical optometric practice. (2 hours)

Advanced Optometric Investigation: Principles and clinical applications of new optometric instruments; such as Nerve Fibre Analyzer (NFA); Orbscan system; Ocular Blood Flow (OBF) and Optical Coherence Tomography (OCT). (4 hours)

Case history taking and symptomatology: Role of the case history in the consultation; questioning techniques and question types; what comprises a case history; recording the history; symptomatology – an overview of symptoms found with various forms of ocular problems (refractive, binocular, organic). (3 hours)

Headaches: Clinical presentations of headaches; various causes of headaches; management of patients with headaches as the chief complaint in an optometric practice. (2 hours)

Prescription decisions: Etiology of refractive errors and the influence of etiological theories on the refractive prescription and monitoring the refraction; relating the prescription to the occupational and other needs of the patient. (2 hours)

Clinical case management: Present simulated and real clinical cases to build up problem solving techniques in case management. (4 hours)

Inter- and intra-profession communication: Discussion on handling of inter- and intra-professional relationships. The skill of communicating information amongst professionals. How to write referral letters. (2 hours)

Laboratory work: Lectures are accompanied by appropriate laboratory work for the development of skills in these areas of optometric investigation. As part of laboratory work, students will be expected to evaluate the relative merits of the procedure and its applications. Lab attendance is compulsory. Students must pass the laboratory component in order to pass the subject.

At the end of the laboratory session, students will be assessed on their skills on performing a primary eye care examination (clinical competency evaluation). This is to prepare them better before starting to see patients in the following semester.

Tutorials: Tutorial sessions, in the form of small, student-led groups, will discuss and evaluate various clinical techniques. Case study techniques will be used where appropriate. Tutorials will thus supplement both lecture and laboratory work.
Assessment

Coursework 60 %
(including a practical assessment. Students must pass the practical assessment and clinical competency evaluation in order to pass the subject)

Examination 40 %
(2 hours written paper)

Reading List

Prescribed Reading


Recommended Reading


Subject Title : Professional Studies                  Code : SO445
Credits : 3                                            Level : 4
Status : Compulsory                                   Stage: 3
Offering Department: SO                               Semester : 5

Teaching Pattern

<table>
<thead>
<tr>
<th>Lectures</th>
<th>6 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-line lectures</td>
<td>10 hours</td>
</tr>
<tr>
<td>Tutorials</td>
<td>12 hours</td>
</tr>
<tr>
<td>On-line tutorials</td>
<td>8 hours</td>
</tr>
</tbody>
</table>

36 hours

Learning Outcomes

On completion of this subject, the student should be able to:
1. demonstrate a knowledge and awareness of patient rights issues and medical ethico-legal issues involving the optometry profession, and other healthcare professions, in Hong Kong and elsewhere
2. explore, evaluate and develop their own codes and standards for practice
3. develop their own analysis of medical ethico-legal issues, clinical decision-making abilities and problem-solving skills
4. have the desire to promote and advance the Optometry profession

Outline Syllabus

Introduction to legal system in Hong Kong
Biomedical ethics
Medical negligence
Consent
Confidentiality and privacy issues
Optometry legislation in Hong Kong
Code of Practice
Professional issues

Assessment

<table>
<thead>
<tr>
<th>Continuous assessment</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group debate</td>
<td>50% (Optometry &amp; Radiography)</td>
</tr>
<tr>
<td>Written assignment</td>
<td>25% (Optometry)</td>
</tr>
<tr>
<td>Written test</td>
<td>25% (Optometry)</td>
</tr>
</tbody>
</table>

Assessment for Case-based Learning for Professional Studies will consist of continuous assessment, comprising of the above components. For the debate, students will be expected to analyse and evaluate an ethico-legal case, so as to show an understanding of the topic being considered, and demonstrate that they can apply the ethico-legal concepts they have learnt. As well as gaining an overall group grade (30%), students will also be
graded individually within tutorial sessions, during preparation time for the debate, so as to generate a grade allocation for each student’s performance and contribution (20%).

For Optometry students, the written assignment is an essay (by individual students) on any topic related to professional issues. Students can decide on their own topic, but a list of suggested topics will be provided for students, to facilitate their decision-making. Students will also be required to sit a test on ethico-legal issues.

**Reading List**


**Clinical journals:**
Medical Law Monitor (CLR: K13. E34)
Journal of Medical Ethics (CD Rom)
Relevant Professional (peer-review) journals

**Access pathway (via the Library Homepage – Social Sciences & Humanities: Law):**
Hong Kong Law Reports and Digest
Hong Kong Cases
All England Reports
Lloyd’s Electronic Law Reports

**Useful e-mail addresses:**
www.ha.org.hk
www.gmc-uk.org
www.austlii.edu.au
www.hkma.com.hk
www.info.gov.hk
www.open.gov.uk/doh/dhome.htm
www.justice.gov.hk/Index.htm
www.doh.uk/coinh.htm
www.echr.coe.int
Subject Title: General and Ocular Pharmacology  
Code: SO410  
Credits: 5  
Level: 4  
Status: Compulsory  
Stage: 3  
Offering Department: SO  
Semester: 6

Teaching Pattern

<table>
<thead>
<tr>
<th>Activity</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>62 hours</td>
</tr>
<tr>
<td>Tutorial</td>
<td>5 hours</td>
</tr>
<tr>
<td>CPR</td>
<td>3 hours</td>
</tr>
<tr>
<td>Laboratory</td>
<td>2 hours</td>
</tr>
</tbody>
</table>

---

CPR (3 hours) will be covered by St. John Ambulance Association.

Learning Outcomes

On completion of this subject, the student should be able to:
1. describe the general principles of drug action, pharmacodynamic, and pharmacokinetic
2. select appropriate drug for cycloplegia, mydriasis, and local ocular anaesthesia
3. manage common dry eye problems using the treatment plans
4. describe the allergic/inflammatory response cascade and hence select different classes of drug for ocular allergy/inflammation treatment
5. comment on different anti-infective eye drops and apply them for treating ocular disorders
6. analyse and apply different anti-glaucoma medications
7. identify the systemic side effects of ocular drugs, and ocular side effects of systemically administered drugs
8. demonstrate cardio-pulmonary resuscitation
9. apply latest research findings on the treatment of ocular diseases
10. make appropriate clinical referrals when necessary in managing ocular conditions

Outline Syllabus

General pharmacology:
- Drug sources
- Routes of drug administration
- Drug absorption and distribution
- Biotransformation of drugs
- Drug elimination
- Modes of drug action
- Receptor and rate theory
- Preservatives
- Legal classification of drugs in Hong Kong
Ocular pharmacology:
Fate of transmitter substances and their action in the eye
Factors affecting drug penetration in the eye
Pharmaceutical aspects of opthalmic drugs, forms and methods of administration
Factors affecting efficacy and stability of opthalmic preparations
Miotics
Mydriatics
Cycloplegics
Local Anaesthetics
Staining agents
Antihistamines and vasoconstrictors
Ocular therapeutic agents
Systemic side effects of ocular drugs
Ocular side effects of systemically administered drugs

C.P.R.
Recognition of the signs and symptoms of a heart attack
How to provide CPR until medical help arrives
How to give first aid for choking

Indicative Content

General Pharmacology
Introduction to pharmacology and pharmaceutical sources - scope of pharmacology; plants, animals, minerals, micro-organisms, and chemical synthesis as sources of pharmaceuticals. (2 hours)

Routes of administration of pharmaceuticals - enteral, parenteral, topical, transdermal, and sublingual administration. Factors affecting route of administration, and relative merit of one route over the others. (1 hour)

Absorption and distribution of pharmaceuticals - factors affecting absorption and distribution of pharmaceuticals: pH-partition theory, physio-chemical properties of drugs; host factors. (2 hours)

Biotransformation of pharmaceuticals - phases of metabolism of pharmaceuticals, factors affecting metabolism of pharmaceuticals, prodrugs. (2 hours)

Elimination of pharmaceuticals - degradation of pharmaceuticals, systems involved in elimination and excretion of pharmaceuticals, routes of elimination, factors affecting elimination of pharmaceuticals. (2 hours)

Modes of action of pharmaceuticals - extracellular, intracellular, receptor and rate theories in the mechanism of action of pharmaceuticals. (2 hours)

Preservatives - preservatives commonly used in opthalmic preparations, physio-chemical and antimicrobial properties, side effects and interactions. (2 hours)

Legal classification of drugs in Hong Kong - Pharmacy and Poisons Ordinance, Antibiotic Ordinance, Dangerous Drugs Ordinance and their Regulations, part I and part II poisons. (1 hour)
Ocular Pharmacology
Review of autonomic nervous system, innervation of the eye, neuronal transmitters in the eye and their interactions with receptor subtypes;
Fate of transmitter substances and their action in the eye - biotransformation of acetylcholine and norepineprine. Receptor types and their distribution in ocular tissues; (2 hours)

Factors affecting penetration of pharmaceuticals in the eye - physical-chemical properties of the pharmaceuticals, morphological structure of the cornea, drainage system of the eye, vasculature of the eye; Methods and frequency of administration of pharmaceuticals;

Aspects of ophthamic pharmaceuticals, form and methods of administration - dosage forms, ocsert, principal requirements of ophthamic preparations, factors affecting efficacy and stability of ophthamic preparations. (2 hours)

Cycloplegics and mydriatics - anticholinergics cycloplegic agents; direct and indirect acting sympathomiimetic and anticholinergic mydriatic agents, and their side effects. (2 hours)

Miotics - parasympathomimetics, sympatholytics, anti-cholinesterases, and their side effects.

Local anaesthetics - mechanisms of action, types of anaesthetics, biotransformation of anaesthetics, and their side effects.

Staining agents - staining properties of fluorescein and rose bengal, and side effects. (2 hours)

Anti-allergic and anti-inflammatory pharmaceuticals - types and classification of pharmaceuticals, modes of action, conditions under which they are to be used, side effects and precautions in use: vasoconstrictors, antihistamines, mast cell stabilizers, corticosteroid, and non-steroidal anti-inflammatory pharmaceuticals. (5 hours)

Anti-infective pharmaceuticals - types and classification of individual groups of pharmaceuticals, modes of action, conditions under which they are to be used, side effects and precautions in use. (5 hours)

Glaucoma therapy - types and classification of individual groups of pharmaceuticals for glaucoma treatment, modes of action, conditions under which they are to be used, side effects and precautions in use. (4 hours)

Treatment of dry eye - lubricants, artificial tears, punctal occlusion and oral supplements. (2 hours)

Pharmacological management of pre- and post- refractive surgery patients. (2 hours)

Pharmacological management of contact lens related problems. (2 hours)

Systemic side effects of ocular pharmaceuticals - ocular absorption of topically applied pharmaceuticals, factors contributing to excessive accumulation of pharmaceuticals, types of adverse reactions of pharmaceuticals, precautions and contra-indications in the use of ocular medications. (2 hours)
Ocular side effects of systemically administered pharmaceuticals - therapeutic agents that induce ocular side effects, dose dependence and idiopathic ophthalmic adverse reactions to pharmaceuticals, interaction between ophthalmic and systemically administered pharmaceuticals, drug-related ocular emergencies. (2 hours)

Therapeutic treatment for anterior eye disorders – conditions affecting the lids, adnexa, the conjunctiva, the cornea, the lacrimal apparatus and the sclera. (6 hours)

Development of management strategies for different ocular diseases – via case studies and computer assisted learning (10 hours)

Laboratory work: (2 hours)
Epilation of trichiasis, punctal occlusion, diagnostic probing and irrigation of the lacrimal system.

CPR: The St. John's Ambulance Brigade will provide three hours of instruction in cardio-pulmonary resuscitation. This will comprise emergency action principles; contacting emergency services in Hong Kong; mouth-to-mouth breathing (mannikin practice) for adults, children and babies; signs of choking - action in conscious and unconscious adults, children and infants; recognition of cardiac arrest and action to be taken; recognition of stroke and action to be taken.

**Assessment**

<table>
<thead>
<tr>
<th>Coursework</th>
<th>40%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examination</td>
<td>60%</td>
</tr>
<tr>
<td>(3 hours written paper)</td>
<td></td>
</tr>
</tbody>
</table>

**Assessment in CPR will be on a pass/fail basis and student will be required to work until a pass is obtained.**

**Reading List**

**Prescribed Reading:**


**Recommended Reading**

Subject Title : Optometry Clinic 1  
Code : SO416

Credits : 2  
Level : 4

Status : Compulsory  
Stage : 3

Offering Department: SO  
Semester : 6

Pre-requisites:  
1. Clinical Optometry 4 (SO443)
2. Clinical refresher workup* if Clinical Optometry 4 (SO443) was completed six months ago or longer

Teaching Pattern

<table>
<thead>
<tr>
<th>Clinic Practice</th>
<th>84 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dispensing Practice</td>
<td>4 hours</td>
</tr>
</tbody>
</table>

_______  
88 hours

Learning Outcomes

On completion of this subject, the student should be able to:
1. extract related information from a visiting client on their optometry needs
2. formulate tentative approaches of investigation based on a client’s presented history
3. perform a routine eye examination, including preliminary investigations, binocular vision, ocular health assessment and refraction
4. direct clients to further optometric assessments if needed
5. give recommendation on optical dispensing
6. adjust and fit spectacles for safety and efficient uses

Outline Syllabus

Patient examination
Application of clinical procedures
Spectacle frame dispensing and adjustment

Indicative Content

Patient examination – performing full vision examinations on patients of the Optometry Clinic, Hong Kong Polytechnic University.

Application of clinical procedures - performing additional clinical procedures as required in the management of patients.

Frame and lens selection. fitting and delivery of spectacles to patients.
Assessment

Coursework 100%

* The “clinical refresher workup” comprises a series of sit-in observations and assessment of clinical techniques in The Optometry Clinic. It aims to maintain the student the knowledge in current clinical care. The student must complete this clinical refresher workup satisfactorily to enable him/her to register for this subject.

Reading List

Prescribed Reading

Benjamin, W.J., Borish, I.M. Borish's clinical refraction, W.B. Saunders, 1998


Recommended Reading

Ball GV. Symptoms in Eye Examination. Butterworths, 1985

Amos J. Diagnosis & Management in Vision Care. Butterworths, 1987
Subject Title : Community Optometry  
Code : SO421  
Credits : 2  
Level : 4  
Status : Compulsory  
Stage : 3  
Offering Department: SO  
Semester : 6

Teaching Pattern

<table>
<thead>
<tr>
<th>Lecture</th>
<th>26 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field work</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>30 hours</td>
</tr>
</tbody>
</table>

Learning Outcomes

On completion of this subject, the student should be able to:
1. explain the roles of optometrists in the community as a primary ocular health care provider
2. plan, organize and conduct a vision-care program in collaboration with a non-optometric organization
3. comment on the uses of luminaries and the basic principles of lighting design on a given environment
4. identify visual hazards in various occupations and sports
5. discuss different means of ocular protection against visual hazards
6. analyze ergonomic issues and give appropriate suggestions related to a standard visual display terminal (VDT)

Outline Syllabus

Role of optometrists in the community  
Visual screening  
Visual ergonomics and lighting  
Visual display terminal  
Visual hazards and ocular protection in occupations and sports

Indicative Content

Role of the optometrist in the community: the optometrist as a primary care provider; his role in the prevention and modification of occupational problems. (3 hours)

Visual screening: the development of visual screening programmes; cost effectiveness of vision screening and its relation to incidence of disease; screening protocols and regimen; visual screeners. (10 hours)
Lighting and visual ergonomics: human visual capabilities and analysis of visual demand in visual tasks; visual requirements for different occupations; visual fatigue and its relation to visual task and visual demand; introduction to the basic concepts in lighting design. (6 hours)

Visual hazards in occupations and sports: the nature and types of occupational/sports eye injuries and their prevention; types and uses of protective eyewear; radiation hazards in industry and their prevention. (4 hours)

The visual display terminal: the visual display unit, its visual demands, its related eye problems, their causes and solutions. (3 hours)

**Assessment**

Coursework 100%

**Reading List**

**Prescribed Reading**


**Recommended Reading**

Shingleton BJ, Hersh PS & Kenyon KR. Eye Trauma. Mosby, St. Louis., 1991


Workstation design for current office environments. American Society of Safety Engineers, 1985
Subject Title : Practice Management  
Code : SO431  
Credits : 3  
Level : 4  
Status : Compulsory  
Stage : 3  
Offering Department: SO  
Semester : 6

Teaching Pattern

Lecture 42 hours

Learning Outcomes

On completion of this subject, the student should be able to:
1. apply basic marketing concepts when starting an optometric practice
2. know how to plan and select different retail locations
3. appreciate the importance of inventory control relating to cost effectiveness
4. implement staff development plans and evaluate outcome through appraisal
5. apply computerization in practice to conduct inventory control and consumer research
6. describe the legal system in relation to optometric practice in Hong Kong
7. know how to plan in legal context on business organization
8. apply knowledge in the formation and implementation of contracts
9. describe the features of different sources and methods of finance
10. acquire a sound understanding of the objectives, functions, regulatory framework and practices of financial reporting
11. apply the techniques and methods in preparation and presentation of financial accounting reports
12. describe taxation issues in Hong Kong

Outline Syllabus

Business Management
Practice establishment and development
Stock control and costing
Staffing and staff relations
Business computerisation

Legal Aspects
An introduction to the legal system
Legal forms of business organisations
Formation and performance of contracts
Statutory control of contracts for the sale of goods, services and employment

Accounting Principles
Sources of finance
Bookkeeping and cash flow
Taxation and taxation planning
Indicative Content

Business Management
Starting a practice; practice development: management and marketing concepts; characteristics of optometry retailing in Hong Kong; understanding retailing components; location and site planning; access; traffic flow; practice layout design; sales promotion and advertising; merchandising; development policies

Stock control and costing: inventory records and inventory control; costing principles; retail security

Staffing and staff relations: recruitment and training of staff; human relations, motivation, leading and communication; staff development; performance appraisal
Business computerisation: the use of computer support in business management, inventory control and accounting; consumer research.
(14 hours)

Legal Aspects
An introduction to the legal system: civil law and criminal law distinguished, the origins and interaction of common law and statute law, the court system (1 hour)

Legal forms of business organisation: sole traders, partnerships and companies - their nature, the process of forming and the extent to which their activities must be disclosed to the government authorities and to the general public (2 hours)

Formation and performance of contracts: the essential ingredients of a contract, legality and restraint of trade, misrepresentation, breach of contract, remedies for breach (5 hours)

Statutory control of contracts for the sale of goods, services and employment: statutory implied terms, control of exemption clauses and the protection of consumers and employees (3 hours)

The tort of negligence: the principles of liability for negligence. The liability of manufacturers and employer's vicarious liability. Professional liability. (3 hours).

Accounting Principles
Sources of finance: sources and methods of financing the establishment or expansion of a practice; leasing; hire purchase; relative advantages and disadvantages of forms of finance

Bookkeeping and cash flow: methods of bookkeeping in practice; ledgers and journals; preparing cash flow summaries and projections; maintenance of cash flow; break-even point and its projection; profit and loss statements; computers in accounting

Taxation and taxation planning: advantages and disadvantages of sole proprietorship, partnership, and company structure; personal and business taxation; taxation planning (14 hours)

Assessment
Coursework 100%
Reading List

Recommended Reading


Association of Optical Practitioners. Financial Management; Personnel and Management; Marketing. AOP Services Ltd/TRACE (Wigan College of Technology) 1988
(These books are produced by the Association of Optical Practitioners for its Practice Enhancement Plan)


Subject Title: Project 1  
Code: SO438  
Credits: 6*  
Level: 4  
Status: Compulsory  
Stage: 3  
Offering Department: SO  
Semester: 6  

Students are required to have attended: Applied Statistics and Research Methodology (HTI376)

Teaching Pattern

Project 14 hours

Learning Outcomes

On completion of this subject, the student should be able to:
1. draw relevant information from the literature with regard to the research topic
2. pursue a research topic conscientiously and rationally
3. interpret, present and discuss information and results logically and clearly in written and poster presentations
4. orally defend own work clearly and logically, showing deep understanding of the researched topic

Outline Syllabus

There is no formal syllabus for this subject. A detailed description of the operation of Project is provided to students and project supervisors.

Assessment

Continuous assessment 100% - Literature Review 20%; Project Report/Poster 80%  
Assessment for this subject is shown only when the student has completed Project 3.

Reading list

Journals related to the chosen topic

Prescribed Reading


Recommended Reading


Subject Title : Case Conference 1  
Credits : 2*  
Status : Compulsory  
Offering Department: SO 

Teaching Pattern  
Tutorial 10 hours 

Learning Outcomes  
On complete of this two-semester course, the student should be able to:  
1. integrate information from different subject areas in making appropriate decisions regarding patient care  
2. integrate information from his or her own experience in making appropriate decisions regarding patient care  
3. organise information related to a given case  
4. identify the relevant/important and irrelevant/less important elements of a case  
5. analyse the information related to a given case  
6. recognise the different approaches which could be taken  
7. recognise the different outcomes these approaches may result in  
8. develop an appropriate management plan  
9. critique patient care decisions made  
10. communicate important elements of a case to professional colleagues in writing and verbally  
11. develop strategies for coping with unusual cases or clinical entities 

Outline Syllabus  
Case Conference 1 comprises seminars on case presentation (both verbal and written) and on communication with fellow professionals. 

Indicative Content  
This subject is complementary to Optometry Clinic 2 and 3 and is seminar based. 

Assessment  
Continuous Assessment (in semester 8) 100%  
Presentations 25 %  
Case reports 50 %  
Viva 25 %
Reading list

There is no set reading list. Journals, especially those with regular cases studies, will be used.
Subject Title : Optometry Clinic 2  
Code : SO441
Credits : 4  
Level : 4
Status : Compulsory  
Stage : 4
Offering Department: SO  
Semester : 7

Pre-requisites:

1. All stages I to III subjects prefixed “SO” must be completed,

2. if Optometry Clinic 1 (SO416) was completed six months ago or longer, an additional clinical refresher workup* will be prescribed to maintain his/her knowledge in current clinical care.

* The “clinical refresher workup” comprises a series of sit-in observations and assessment of clinical techniques in the Optometry Clinic. The student must complete this clinical refresher workup to enable him/her to register for this subject.

Teaching Pattern

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>5 hours</td>
</tr>
<tr>
<td>Clinic</td>
<td>138 hours</td>
</tr>
<tr>
<td>Field Study</td>
<td>55 hours</td>
</tr>
</tbody>
</table>

________

198 hours

Learning Outcomes

Upon completion of this subject, the student should be able to:
1. practise clinical optometry in a professional and ethical manner
2. work in diversified clinical facilities of eye care service
3. identify visual and ocular problems effectively in a clinical facility and collect relevant information pertinent to the problems
4. assess and diagnose accurately the visual performance and ocular characteristics of a patient
5. manage the visual / ocular abnormality with a clear justification including optical treatment, close monitoring and referral
6. communicate effectively with the patients, the educators and other professionals including presentation of symptoms, critical analysis of clinical findings and proposed plan of action
7. take up professional responsibility and appreciate the need to learn continuously in primary eye care
Outline Syllabus

Primary care optometric examination and counselling
Case analysis
Prescribing vision care and treatment
Hospital visits

Indicative Content

The student must acquire the ability and confidence to conduct and prescribe all aspects of general optometric investigation and management. This is achieved by attending clinical rotations at the Optometry Clinic. Clinical work is complemented by seminar discussions in the subject Case Conference. A logbook is given to the student that details the minimum number of clinical procedures conducted as a requirement to pass the subject.

Clinical sessions may be scheduled in the summer semester whenever deemed appropriate. Five lecture hours are scheduled to allow the Clinic Chief to meet regularly with the students to exchange information and to review the work being undertaken. Students will visit the hospitals where they will have the opportunity to observe abnormal eye conditions not commonly encountered in the optometric practice.

Assessment

Continuous assessment

100%

Reading List

Prescribed reading


Recommended Reading


Subject Title : Project 2  
Code : SO446  
Credits : 6*  
Level : 4  
Status : Compulsory  
Stage : 4  
Offering Department: SO  
Semester : 7  

Students are required to have completed: Project 1 (SO438)

Teaching Pattern

Project 42 hours

Learning Outcomes

On completion of this subject, the student should be able to:
1. draw relevant information from the literature with regard to the research topic
2. pursue a research topic conscientiously and rationally
3. interpret, present and discuss information and results logically and clearly in written and poster presentations
4. orally defend own work clearly and logically, showing deep understanding of the researched topic

Outline Syllabus

There is no formal syllabus for this subject. A detailed description of the operation of Project is provided to students and project supervisors.

Assessment

Continuous assessment 100% - Literature Review 20%; Project Report/Poster 80%
Assessment for this subject is shown only when the student has completed Project 3.

Reading List

Journals related to the chosen topic

Prescribed Reading


Recommended Reading


Subject Title : Contact Lens Clinic 1       Code : SO448
Credits : 2*       Level : 4
Status : Compulsory       Stage : 4
Offering Department: SO       Semester : 7

Pre-requisites:

1. All stages I to III subjects prefixed “SO” must be completed,

2. if Contact Lens Practice (SO423) was completed six months ago or longer, an additional clinical refresher workup* will be prescribed to maintain his/her knowledge in current clinical care.

* The “clinical refresher workup” comprises a series of sit-in observations and assessment of clinical techniques in the Optometry Clinic. The student must complete this clinical refresher workup to enable him/her to register for this subject.

Teaching Pattern

Clinic       42 hours

Learning Outcomes

Upon completion of this subject, the student should be able to:
1. identify common contact lens-related issues in a clinical facility
2. collect relevant background information from the patient
3. measure the ocular parameters accurately and effectively pertinent to the contact lens issues
4. adequately select and provide a suitable contact lens prescription
5. assess and diagnose accurately the visual performance of a contact lens patient and the lens fitting characteristics
6. identify and manage common ocular complications related to contact lens wear
7. prescribe a contact lens care regimen to the patient
8. communicate effectively with the patients, the educators and other professionals including presentation of symptoms, critical analysis of clinical findings and proposed plan of action
9. take up professional responsibility and appreciate the need to learn continuously in contact lens care

Outline Syllabus

Patient examination
Case analysis
Prescribing, care and treatment
Indicative Content

The student must acquire good clinical and management skills, and be effective at clinical reasoning or problem solving in contact lens practice.

Assessment

Continuous assessment 100% (Clinic assessment)

Reading List

Prescribed reading


Subject Title : Case Conference 2
Credits   : 2
Status   : Compulsory
Offering Department: SO
Pre-requisite  : Optometry Clinic (SO441)

Teaching Pattern
Seminars (student-led) 18 hours

Learning Outcomes
On complete of this two-semester course, the student should be able to:
1. integrate information from different subject areas in making appropriate decisions regarding patient care
2. integrate information from his or her own experiences in making appropriate decisions regarding patient care
3. organise the information related to a given case
4. identify the relevant/important and irrelevant/less important elements of a case
5. analyse the information related to a given case
6. recognise the different approaches which could be taken
7. recognise the different outcomes these approaches may result in
8. develop an appropriate management plan
9. critique patient care decisions made by him or her, or by others
10. communicate the important elements of a case to professional colleagues in writing and verbally
11. develop a strategy for coping with unusual cases or clinical entities

Outline Syllabus
Students will present cases both verbally (in small groups) and in writing (individually).

Indicative Content
This subject is complementary to Optometry Clinic 2 and 3 and is seminar based.

Assessment
Continuous Assessment 100%
Presentations 25%
Case reports 50%
Viva 25%
Reading list

There is no set reading list. Journals, especially those with regular cases studies, will be used.
### Subject Title
Project 3

### Code
SO447

### Credits
6

### Level
4

### Status
Compulsory

### Stage
4

### Offering Department
SO

### Semester
8

Students are required to have attended: Project 2 (SO446)

#### Teaching Pattern

| Project | 84 hours |

#### Learning Outcomes

On completion of this subject, the student should be able to:

1. draw relevant information from the literature with regard to the research topic
2. pursue a research topic conscientiously and rationally
3. interpret, present and discuss information and results logically and clearly in written and poster presentations
4. orally defend own work clearly and logically, showing deep understanding of the researched topic

#### Outline Syllabus

There is no formal syllabus for this subject. A detailed description of the operation of Project is provided to students and project supervisors.

#### Assessment

Continuous assessment 100% - Literature Review 20%; Project Report/Poster 80%

#### Reading list

Journals related to the chosen topic

**Prescribed Reading**


**Recommended Reading**


Pre-requisites:

1. Contact Lens Clinic 1 (SO448),

2. if “Contact Lens Clinic 1” was completed six months ago or longer, an additional clinical refresher workup* will be prescribed to maintain his/her knowledge in current clinical care.

* The “clinical refresher workup” comprises a series of sit-in observations and assessment of clinical techniques in the Optometry Clinic. The student must complete this clinical refresher workup to enable him/her to register for this subject.

Teaching Pattern

Clinic 42 hours

Learning Outcomes

Upon completion of this subject, the student should be able to:
1. identify all contact lens-related issues in a clinical facility
2. collect relevant background information from the patient
3. measure the ocular parameters accurately and effectively pertinent to the problems
4. adequately select and provide a suitable contact lens prescription
5. assess and diagnose accurately the visual performance of a contact lens patient and the lens fitting
6. characteristics
7. identify and manage the ocular complications related to contact lens wear
8. prescribe a contact lens care regimen to the patient
9. communicate effectively with the patients, the educators and other professionals including presentation of symptoms, critical analysis of clinical findings and proposed plan of action
10. take up professional responsibility and appreciate the need to learn continuously in contact lens care

Outline Syllabus

Patient examination
Case analysis
Prescribing, care and treatment
Indicative Content

The student must acquire good clinical and management skills, and be effective at clinical reasoning or problem solving in contact lens practice.

More emphasis will be placed on management rather than skills.

Assessment

Continuous Assessment 100% (Clinic assessment)

Reading List

Prescribed Reading


Subject Title   : Optometry Clinic 3    Code : SO450
Credits   :  5      Level : 4
Status   : Compulsory     Stage : 4
Offering Department: SO     Semester : 8

Pre-requisites:

1. Optometry Clinic 2 (SO441).

2. if “Optometry Clinic 2” was completed six months ago or longer, an additional *clinical refresher workup* will be prescribed to maintain his/her knowledge in current clinical care.

* The “clinical refresher workup” comprises a series of sit-in observations and assessment of clinical techniques in the Optometry Clinic. The student must complete this clinical refresher workup to enable him/her to register for this subject.

Teaching Pattern

<table>
<thead>
<tr>
<th>Lecture</th>
<th>4 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinic</td>
<td>200 hours</td>
</tr>
<tr>
<td></td>
<td>204 hours</td>
</tr>
</tbody>
</table>

Learning Outcomes

Upon completion of this subject, the student should be able to:
1. practise clinical optometry in a professional and ethical manner
2. work in diversified clinical facilities of eye care service
3. identify visual and ocular problems effectively in a clinical facility and collect relevant information pertinent to the problems
4. assess and diagnose accurately the visual performance and ocular characteristics of a patient
5. manage the visual / ocular abnormality with a clear justification including optical treatment, vision therapy, close monitoring and referral
6. communicate effectively with the patients, the educators and other professionals including presentation of symptoms, critical analysis of clinical findings and proposed plan of action
7. take up professional responsibility and appreciate the need to learn continuously in primary eye care
8. articulate the roles of optometrist in the health care system
Outline Syllabus

Primary care optometric examination and counselling
Case analysis
Prescribing vision care and treatment

Indicative Content

The student must acquire the ability and confidence to conduct and prescribe all aspects of
general optometric investigation and management. This is achieved by attending clinical
rotations at the Optometry Clinic. Clinical work is complemented by seminar discussions
in the subject Case Conference. A logbook is given to the student that details the
minimum number of clinical procedures conducted as a requirement to pass the subject.

Clinical sessions may be scheduled in the summer semester where deemed appropriate.
Five lecture hours are scheduled to allow the Clinic Chief to meet regularly with the
students to exchange information and to review the work being undertaken. Students have
external rotations where they will have the opportunity to observe abnormal eye
conditions not commonly encountered in the optometric practice.

Assessment

Continuous assessment 100%

Reading List

Prescribed Reading

Benjamin WJ, Borish IM. Borish's clinical refraction. Philadelphia, Pa.: W.B. Saunders,
1998.

Grosvenor TP. : Anomalies of refraction and binocular vision. Butterworth-Heinemann,
1996.

Eskridge JB, Amos JF, Bartlett JD. (ed) Clinical procedures in Optometry. JB Lippincott

Recommended Reading


Scheiman M, Wick B. Clinical management of binocular vision. J.B. Lippincott Co.