

KING SAUD UNIVERSITY
COLLEGE OF APPLIED MEDICAL SCIENCES

STUDENT GUIDE

Department of Optometry and Vision Sciences

Academic year 1432/33H (2011/12C)

1. INTRODUCTION

1.1 About the Department

Optometry and Vision Sciences is one of the departments of the Faculty of Applied Medical Sciences at King Saud University in Riyadh. It has been established in order to meet the Kingdom's need for Optometrists qualified to work in the health sectors, for screening and treatment of low vision, correction of optical problems with vision, and to raise the level of health services available in the Kingdom, whilst also contributing to the scientific and technical progress in the health sectors in general.

1.2 Description of the profession

Optometrists are specialists for eye and vision related abnormalities. They examine patients' eyes, test their sight, give advice on visual problems, prescribe and fit spectacles or contact lenses if necessary, recognise diseases of the eye as well as general health conditions. Most of these activities involve the use of specialist equipment. Whenever necessary, Optometrists may refer patients to medical practitioners or Ophthalmologists.

1.3 Career opportunities

Optometrists may work in:

- a) private practices,
- b) in hospitals, alongside other healthcare professionals, such as medical doctors and orthoptists, or
- c) in academic settings doing research and/or teaching.

See also section 10 of this handbook.

2. VISION OF THE DEPARTMENT

Leadership and excellence in teaching, research and community service in the field of Optics and Vision Sciences.

3. MISSION OF THE DEPARTMENT

To produce well-rounded graduates in the new and exciting field of Optometry and Vision Sciences, who – in collaboration with the government, industry and the wider community – will contribute to primary eye care, vision research, and community outreach programs, with the aim of improving primary, secondary, and tertiary preventive eye care in the Kingdom of Saudi Arabia.

4. GOALS OF THE DEPARTMENT

- Teaching: The Department aims to be recognized as an excellent department in teaching.
- Patient care: To train sufficient numbers of students who will be able to provide efficient, cost-effective and goals-oriented vision care tailored to the specific needs of individual patients.
- Research: To build a culture of clinical and basic research in Optometry and Vision Sciences, with a view to creating a centre of research excellence in the Kingdom of Saudi Arabia and in the wider Middle East.
- Facilities: To have state-of-the-art facilities, training programs and paradigms, which create an integrative approach to education, research, training, and service delivery.

5. DEPARTMENTAL FEATURES

5.1 Facilities

The Optometry department has eight big laboratories for around 50 students and 14 small clinical rooms, so that all students can perform experiments at a time and practice on the optometry equipment in the clinical rooms. All classrooms have E-learning equipment (i.e., smart board, an E-podium, a projector, and internet connectivity). The college has three general computer labs for students. There are currently 29 lecturers and an additional 19 clinical demonstrators employed in the department.

5.2 Optometry Club

Optometry students go into the community in their spare time and provide eye care for the disadvantaged (orphans, elderly in care homes), screen school children in departmental clinics under supervision of Optometry staff, and also raise the community's general awareness for eye and vision related problems during presentations and vision screening procedures in popular areas such as shopping malls.

5.3 Saudi Association of Optometry and Vision Sciences

Saudi Association of Optometry and Vision Sciences aims to achieve the following goals;

- development of scientific thought professional in the specialized field of optics and vision science and the development of scientific and professional performance of members of the assembly –
- provide an opportunity for workers in the areas of specialization and interests of optometry and vision science to contribute to the movement of scientific progress and professionalism in these areas –
- facilitate the exchange of scientific production and scientific ideas and professional areas of interests of the assembly between institutions and relevant bodies within and outside Saudi Arabia
- provide advice and carry out necessary studies to raise the level of performance in the areas of the assembly's attention in the various institutions and bodies–
- contribute to the development of standards to practice in the specialty of optics and vision science and participate in monitoring their performance and maintain

6. ACADEMIC PROGRAMS

The department offers a 4.5-year undergraduate program "Bachelor in Optometry and Vision Science" and a 2-year postgraduate program "Master of Sciences in Optometry and Vision Sciences".

7. THE PLAN OF STUDY AND BACHELOR DEGREE REQUIREMENTS

7.1 Entry requirements

The department has not specific requirements for admissions, however, the university's general admission requirements for medical programs apply, which can be found online:

<http://ksu.edu.sa/Students/ProspectiveStudents/Admissionrequirements/Pages/Bachelors.aspx>

7.2 Graduate requirements for Bachelor degree

Requirement	Courses	Hours
University requirements	1- English language, health science 2- Arabic language (level 1& 3) 3- Islamic cultures (level 1,3,4,5)	1- 23 hours 2- & 3- with total 12 hours
College Requirements	One general term	13 hours
Department requirements	The courses outlined in section 9 of this guide	92 hours
Other requirements	Internship in a Government hospital	One year before graduation, divided into 4 terms, each term 3 months
Total		140 hours + internship

8. THE TRAINING YEAR (INTERNAL SHIP)

Each student spends a full year of training in three different hospitals (under the supervision of the hospital staff). The student should respect the hospital's systems were being trained. At the end of each four-month period the hospital evaluates the student according to the evaluation sheet provided by the Optometry department.

9. COURSE DESCRIPTION AND THE NUMBER OF HOURS OF THEORETICAL AND PRACTICAL WORK FOR EACH COURSE

9.1 Required Courses

#	Course No.	Course Title	Credit Hours			Pre-Requisite
			L*	P*	T*	
1	BMT 227	Introduction to Personal Computing	1	1	2	OPTO 292
2	OPTO 241	Ocular Anatomy and Physiology	2	1	3	College Core
3	OPTO 242	Ocular Neuroanatomy and Physiology	3	0	3	OPTO 241
4	OPTO 251	Optics	2	1	3	College Core
5	OPTO 253	Ophthalmic Optics I	1	1	2	OPTO 251
6	OPTO 262	Clinical Methods I	2	1	3	College Core
7	IC 103	Islamic Economy	2	0	2	IC 102
8	OPTO 263	Clinical Methods II	2	1	3	OPTO 262
9	OPTO 271	Visual Science I	1	1	2	College Core
10	OPTO 272	Visual Science II	1	1	2	OPTO 271
11	OPTO 273	Visual Optics	3	0	3	OPTO 251
12	IC 104	Islam and Construction of Society	2	0	2	IC 103
13	OPTO 292	Introduction to Optometry	2	0	2	College Core
14	OPTO 343	General Pharmacology	2	0	2	OPTO 242
15	OPTO 344	Ocular Disease I	2	0	2	OPTO 242
16	OPTO 345	Ocular Disease II	3	0	3	OPTO 344
17	OPTO 353	Ophthalmic Optics II	1	1	2	OPTO 253
18	OPTO 354	Contact Lenses I	1	1	2	OPTO 251
19	OPTO 355	Contact Lenses II	1	1	2	OPTO 354
20	OPTO 356	Physical Optics	2	0	2	OPTO 251
21	OPTO 363	Clinical Methods III	1	2	3	OPTO 263
22	OPTO 364	Clinical Methods IV	1	2	3	OPTO 363
23	OPTO 365	Advanced Techniques	1	1	2	OPTO 363
24	OPTO 374	Binocular Vision	1	1	2	OPTO 273
25	OPTO 371	Optometric Statistic	2	1	3	BMT 227
26	OPTO 375	Anomalies of Binocular Vision	1	1	2	OPTO 374
27	OPTO 377	Visual Science III	2	0	2	OPTO 272
28	OPTO 394	Geriatric Optometry	2	0	2	OPTO 344
29	OPTO 456	Contact Lenses III	1	1	2	OPTO 355
30	OPTO 466	Optometry Clinic I	0	3	3	OPTO 365
31	OPTO 469	Optometry Clinic II	0	4	4	OPTO 466
32	OPTO 475	Visual Science Project	0	4	4	OPTO 377

33	OPTO 491	Optometric Practice	2	0	2	OPTO 292
34	OPTO 492	Case Analysis	2	0	2	OPTO 364
35	OPTO 493	Orthoptics	1	1	2	OPTO 375
36	OPTO 495	Low Vision	2	1	3	OPTO 394
37	OPTO 496	Occupational Vision	2	0	2	OPTO 272 OPTO 491
38	OPTO 497	Pediatric Optometry	2	0	2	OPTO 375 OPTO 493
L = Lecture, P= Practical, T= Total						

9.2 Courses description

Students who finished the College core program are considered for the following five courses that represent level 4 of the Bachelor program:

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 241	Ocular Anatomy and Physiology	2	1	3
Description				

In this first class of a two semester series covering the eye and nervous system, gross anatomy, histology and terminology pertaining to structural and functional relationships of ocular tissues and related adnexa including osteology of the skull and orbit are discussed. Orbital contents including: fascia, tendons, muscles, fat, glands, nerves, vessels, lids and the lacrimal system are studied. The globe is further studied as sclera, cornea, uvea, retina, crystalline lens, anterior, posterior, and vitreous chambers. Laboratories include dissection of a mammalian eye and histology with emphasis on clinical significance.

Textbook

1. *Adler's Physiology of the Eye*. Clinical Application (7th Edition, 1981).
2. *Ophthalmic Anatomy*. A manual with some clinical applications, M.J.Reeh, J.L. Wobig, & J.D. Wirtschafter (1981).
3. *Ocular Anatomy and Physiology*, Trygve Saude (Published by Blackwell Science, 1993).
4. *The Ophthalmic Assistant*, Stein-Slatt (Stein, 1994).
5. *General Ophthalmology* 14th Edition, Daniel Vaughan and Taylor Asbury and Paul Riordan Eva (1995).

Pre-requisite

College Core

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 251	Optics	2	1	3

Description

This is an introductory course in geometrical optics. Introduction to light and optics, wavelength, frequency, speed of light, index of refraction, and optical length will be discussed. Image formation by plane mirrors and their properties, image formation by spherical convex mirrors, concave mirrors, properties of the image and magnification, refraction through plane surfaces, image deviation, real and apparent depth, prisms, ophthalmic prisms, image deviation, minimum deviation. Introduction to curvature and spherical surfaces, sag formula, calculation of power, radius of curvature, refraction through spherical surfaces, convex surfaces, concave surfaces, image formation, magnification, focal length, surface power, thin lenses, types, power, focal lengths, surface power, thin lenses, lens formula, thick lenses, thick lens formula, focal lengths, thick lens power, sphero-cylindrical lenses, focal planes, power....

Textbook

1. *Optics* 10th Edition, Freeman M. H. (Published by Butterworth-Heinemann, 1990)

Pre-requisite

College Core.

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 262	Clinical Methods I	2	1	3

Description

This first class in a four-course series is designed to teach the student how to perform basic visual examination techniques: Case history, visual acuity, pinhole, IPD (inter-pupillary distance), penlight examination of the external eye and anterior chamber, pupillary function, duction, version, NPC (near point of convergence), NPA (near point of accommodation), phoria test (e.g. Maddox Rod, Red Glass test), confrontation field, stereopsis, and Worth-4-dot.

Textbook

1. *Clinical Procedures in Optometry*, Eskridge, Amos and J.D.Bartlett.
2. *Primary Care of Optometry*, 3rd Edition, T.Grsvenor (Published by Butterworth-Heinemann)
3. *Optometric Examination. A Clinical Manual*, 4th Edition, W.S. Long (Published by W.S. Long, Canada 1996)

Pre-requisite

College Core

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 271	Visual Science I	1	1	2

Description

This course is the first in a three-course series that introduces the student to the study of light and its role in vision. Topics to be covered include: Light as an electromagnetic radiation, Photometry, Inverse square law and cosine law, Reflectance, Absorption and Optical density, Visible spectrum as dictated by optical media characteristics. Functional differences between rods and cones, Retinal distribution light interaction with rods and cones. The basis of photopic and scotopic vision, Types of visual acuity.

Textbook

1. *Visual Perception*, Cornsweet.
2. *Physiology of the Eye*, Hugh Davson.
3. *Optics*, A.H. Tunacliffe and I.G. Hirst.
4. *Physics with Modern Applications*, Leonard H. Greenberg.
5. *The Ophthalmic Assistant*, Stein–Slatt (Stein, 1994).
6. *Clinical Optics*, 2nd Edition, A.R.Elkington & H.J. Frank.

Pre-requisite

College Core

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 292	Introduction to Optometry	2	0	2

Description

This course series is designed to familiarize the student with the history of optometry, characteristics of professions, interprofessional relations, scope and status of optometric service, optometric organizations and ethical considerations of patient care. Fundamental optometric terminology and basic procedures will also be introduced. Brief introduction of the eye and types of refractive error: myopia, hyperopia and astigmatism and their causes and correction. Introduction about the low vision devices, the ophthalmic equipment and their eye examination will also be discussed.

Textbook

1. *Clinical Refraction*, 3rd Edition, Irvin M. Borish (Published by Irvin M. Borish, 1985).
2. *Foundations of Low Vision: Clinical and Functional Perspective*, Anne L. Corn and Allan J. Koenig (1996).
3. *The Ophthalmic Assistant*, Stein–Slatt (Stein, 1994).

Pre-requisite

College Core

End of Level 4

Level 5

Course No.	Course Title	Credit Hours		
		L	P	T
BMT 227	Introduction to Personal Computing	1	1	2

Description

This course introduces the student to the basics of computer use. The course covers: MS-DOS, introduction to windows operating system, word processing, statistical program, Introduction to BASIC programming.

Textbook

1. *Computers in your Future*, 4th Edition, B.Pfaffenberger (Published by Prentice Hall, 2002)

Pre-requisite

OPTO 292

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 242	Ocular Neuro-anatomy and Physiology	3	0	3

Description

In this second and final class of a two-semester series covering the anatomy and physiology of the eye and the nervous system, the student will gain a basic understanding of the central nervous system. Neuroanatomy and neurophysiology of the eye and visual system will be studied: Gross anatomy, histology, physiology and functional significance of the optic nerve, optic chiasma, optic radiation, lateral geniculate body, the visual cortex and the blood supply of the visual paths will be studied. Visual information processing and introduction to visual field defects will be covered. The trigeminal, oculomotor, trochlear, abducens, optic and facial nerves, their nuclear organization and innervation of the ocular and extraocular tissues will also be studied.

Textbook

1. *Clinical Neuro-Anatomy for Medical Students*, 3rd Edition, Richard S. Snell (1992).
2. *Ocular Anatomy and Physiology*, Trygve Saude (Published by Blackwell Science, 1993).

Pre-requisite

OPTO 241

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 253	Ophthalmic Optics I	1	1	2

Description

This course stresses the ophthalmic applications of physical and geometrical optics. Lecture topics are: Introduction to lens and lens materials, Plastic materials, Curvature, Surface powers and forms of lenses, Crossed cylinders, Toric lenses, Prisms, Risley prisms and Fresnel press-on prisms, Lens aberrations, Frames and mounting.

Textbook

1. *Clinical Optics* 2nd Edition, Fannin, T. and Grosvenor, T. (Published by utterworth-Heinmann, 1996).
2. *Ophthalmic Prescription Work* 2nd Edition, By Arthur Bennet and Simon Blumlein.
3. *Ophthalmic Lenses and Dispensing*, M.Jalie (Published by Butterworth-Heinmann, 1999).
4. *Geometric, Physical and Visual Optics*, Michael Keating.

Pre-requisite

OPTO 251

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 263	Clinical Methods II	2	1	3

Description

This is the second in a series of four courses. In this course, the student will learn to perform the following tests: static Retinoscopy, Keratometry, direct Ophthalmoscopy, and Slit-lamp Biomicroscopy of the external eye and the anterior segment. Color vision tests: Ishiahra (and other pseudo-isochromatic plate-based test), D-15 and Farnsworth-Munsell 100 Hue Test.

Textbook

1. *Clinical Procedures in Optometry*, J. Boyd Eskridge, J.F. Amos and J.D.Bartlett.
2. *Primary Care Optometry*, 3rd Edition, T.Grsvenor (Published by Butterworth-Heinemann)
3. *The Optometric Examination. A Clinical Manual*, 4th Edition, W.S. Long (Published by W.S. Long, Canada 1996).
4. *The Ocular Examination (Measurements & Findings)*, K.Zadnik, (Published by W.B. Saunders Co., 1997).
5. *Clinical Refraction*, 3rd Edition, Irvin M. Borish (Published by Irvin M. Borish, 1985).

Pre-requisite

OPTO 262

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 272	Visual Science II	1	1	2

Description

This second of a three-course series further introduces the student to the study of light and its role in vision. The photochemistry and electro physiology and sensory aspects of vision: thresholds and adaptation will be studied. The concept of threshold- frequency of seeing curve (adjustment method), sensitivity, J.N.D Temporal phenomena: flicker, Talbot-Plateau law, will all be studied in this course. Spatial phenomena: (simultaneous contrast) will also be studied.

Textbook

1. *Visual Optics* (Vol. I and II), H.H. Elmsley, Published by Butterworths.
2. *Visual Optics and Refraction*, D.D. Micheals, Published by C.V. Mosby.
3. *Visual Perception*, T.N. Cornsweet, Published by Academic Press.

Pre-Requisite

OPTO 271

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 273	Visual Optics	2	0	2

Description

The study of the eye as an optical system is the main theme of this course. Catoptric and dioptric images of the eye will be studied. The optics of the eye will be discussed based on the Gullstrand and the reduced schematic eye models. Areas of discussion will include: refractive components (cornea and lens), principal points, ocular axes and angles. Emmetropia and ametropia (hyperopia, myopia and astigmatism) will be studied under the following sub-topics: Causes; far and near points; spectacle refraction. Retinal image size in uncorrected and corrected ametropia will be discussed. The far point, near point, and range of accommodation as applicable to the emmetrope, myope and hyperope will also be treated.

Textbook

1. *Visual Optics* (Vol. I and II), H.H. Elmsley, Published by Butterworths.
2. *Visual Optics and Refraction*, D.D. Micheals, Published by C.V. Mosby.
3. *Physiology of the Eye*, Hugh Davson, Published by Academic Press.

Pre-Requisite

OPTO 251

End of Level 5

Level 6

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 343	General Pharmacology	2	0	2

Description

This course is designed to give the optometry students an overview on the general principles of pharmacokinetics, pharmacodynamics, therapeutic uses and adverse effects of drugs. Discussion on major classes of drugs as well as prescription versus over-the-counter prescription drugs will be undertaken. Emphasis is placed on ocular diagnostic agents, i.e. mydriatics, cycloplegics and anesthetics and fluorescein. Additionally, pharmacology of drugs used in glaucoma, dry eye agents, ocular decongestants, anti-allergics, anti-inflammatory, immuno-suppressants, antimicrobials, antivirals and antifungal drugs will be discussed. Significant drug-induced ocular adverse effects of drugs and contraindication to drug therapy will also be included.

Textbook

1. *Textbook of Ocular Pharmacology* (Latest Edition), Zimmerman, Kooner, Shair and Frehtner, (Published by Lippincott Williams & Wilkins).
2. *Ocular Pharmacology*, Wiliiaa H. Havener.

Pre-Requisite

OPTO 242

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 344	Ocular Disease I	2	0	2

Description

This class is the first of two course series designed to give undergraduate students an introduction to the diseases and injuries significant to an optometrist. Included in this discussion would be pertinence of patient's history and prompt and appropriate referral. Basic disease processes, diagnosis, therapy and prognosis for: ocular trauma and burns, diseases of the eyelids and lacrimal system, orbital disorders; uveal, corneal and external diseases will also be studied.

Textbook

1. *General Ophthalmology* 12th Edition, Daniel Vaughan et al., (Published by Appleton and Lange, 1989).
2. *Ophthalmology for Primary Care*, Gloria Wu, (Published by W.B. Saunders Co., 1997).
3. *Ophthalmology for Health Care Professional*, G.A. Cioffi.
4. *Drugs in Primary Eye care* 2nd Edition, D.R. Woodard and R.B. Woodard, (Published by Appleton and Mange, 1997).

Pre-Requisite

OPTO 242

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 353	Ophthalmic Optics II	2	1	3

Description

This course is the last in a two-course lecture series. The following topics will be covered: The advanced study of the optics involved in modern lens design, Prismatic effect of decentration, oblique prismatic effect, Prismatic effect of cylindrical lenses, Specification of lens and frame sizes, Lens decentration, Decentration of sphero-cylindrical lenses, Bifocal lenses, Characteristics and selection criteria, Cosmetic consideration of lenses, Frames and lens tints.

Textbook

1. *Clinical Optics* 2nd Edition, Fannin, T. and Grosvenor, T. (Published by Butterworth-Heinmann, 1996).
2. *Ophthalmic Prescription Work* 2nd Edition, By Arthur Bennet and Simon Blumlein.
3. *Ophthalmic Lenses and Dispensing*, M.Jalie (Published by Butterworth-Heinmann, 1999).
4. *Geometric, Physical and Visual Optics*, Michael Keating.

Pre-Requisite

OPTO 253

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 354	Contact Lenses I	1	1	2

Description

In this first of a three course series, the history of contact lens development is discussed leading to current lens materials, soft lens design and manufacturing techniques. Parameters such as DK, DK/L, wetting angle, water content, thickness, edge, diameter, moncurve versus multicurve design and sagittal depth will be discussed. Fitting considerations of soft lenses for optimal physiological function; lag, sag, movement on blink; evaluation of VA, OR, OK, slit-lamp examination and vertex calculations. Criteria for patient selection and training as well as discussion of contact lens care systems.

Textbook

1. *Contact Lens Practice* 1st Edition, Ruben M. and Guillon M., 1994.
2. *Manual of Contact Lens Prescribing and Fitting*, Hom, MM,(Published by Butter-worth-Heinemann, 1997).
3. *Contact Lenses* 3rd Edition, Vol. I and II, Stone J. and Philips A.J., 1992.

Pre-Requisite

OPTO 251

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 356	Physical Optics	2	0	2

Description

In this course, the student will be introduced to principles of wave optics; interference, diffraction, dispersion, polarization, holography, chromatic aberration and achromatic lenses, spectroscopy and lasers.

Textbook

1. *Physics*, Douglas C. Giancoli, (Published by Prentice Hall).
2. *Applied Physics*, Tippens, (Published by Mc Grow-Hill).
3. *Optics*, M.H. Freeman, (Published by Butterworths)

Pre-Requisite

OPTO 251

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 371	Optometric Statistics	2	1	3

Description

The student should also be introduced to at least one computer statistical package. Descriptive statistics: Data presentation, measures of central tendency (mean, median, mode), measures of dispersion (range, variance, standard deviation). Data plots: 2 and 3-dimensional plots, bar charts and pie charts.

Interferential statistics: Normal distribution, probability, sampling distribution (z-test, t-test), ANOVA one-way and multifactor. Non-parametric procedures: Chi-square test, Wilcoxon ranks test. In the final part; the student will study datamation (the art and science of gathering, analyzing and presenting experimental data), the research and bibliography.

Textbook

1. *BIOSTATISTICS* –A foundation for analysis in the Health Sciences, Wayne W. Daniel.
2. *Data analysis with Student Systat*, Kenneth N. Berk, 1994

Pre-Requisite

BMT 227

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 363	Clinical Methods III	1	2	3

Description

In this third class of a series, the student will learn to perform additional refraction examination techniques including: monocular subjective refraction, use of the JCC, accommodative amplitude measurements, phorias, vergences and determination of ADD.

Textbook

1. *Primary Care Optometry*, Theodore Grosvenor, (Published by Professional Press Book, 1989)

Pre-Requisite

OPTO 263

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 374	Binocular Vision	1	1	2

Description

Discussion of the benefits of binocular vision to man as well as the many effect and phenomena found in vision secondary to binocularity including: sensory aspects of binocular vision, sensory fusion, fixation disparity analysis, accommodation, AC/A ratio, convergence, zone of clear single binocular vision, criteria for lens and prism prescription and ultimately binocular perception.

Textbook

1. *Binocular anomalies – diagnosis and vision therapy*, Griffin J.R.. and Grishan J.D., Butterworth-Heinemann, 1995.
2. *Pickwell's binocular vision anomalies: investigation and treatment*, 4th edition, B.J.W. Evans, Butterworth-Heinemann, 2002.

Pre-Requisite

OPTO 273

End of Level 6

Level 7

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 345	Ocular Disease II	3	0	3

Description

This class is the second and final in the series. Lecture topics are: disease of uveal tract, cataract, glaucoma, vitreous, retinal diseases, visual pathways and ocular manifestations of systemic diseases.

Textbook

1. *General Ophthalmology* 12th Edition, Daniel Vaughan et al., (Published by Appleton and Lange, 1989).
2. *Clinical Ophthalmology –A text and Color Atlas*, Bankes, James L.K, 1982.

Pre-Requisite

OPTO 344

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 355	Contact Lenses II	1	1	2

Description

This second course in a three-semester series will discuss topics pertaining to fitting of rigid contact lenses. Adding to the information base presented in the previous semester, topics will include: History of hard/RGP contact lenses, Optics of Contact lenses, Hard lens parameters, Hard lens materials and design, Patient selection, Hard lens fitting, Hard lens care regime, Corneal changes due to lens wear, Corneal changes/Complications due to hard lens wear.

Textbook

1. *Contact Lens Practice* 1st Edition, Ruben M. and Guillon M., 1994.
2. *Manual of Contact Lens Prescribing and Fitting*, Hom, MM,(Published by Butter-worth-Heinemann, 1997).
3. *Contact Lenses* 3rd Edition, Vol. I and II, Stone J. and Philips A.J., 1992.

Pre-Requisite

OPTO 354

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 364	Clinical Methods IV	1	2	3

Description

In this final class in a four-course series. The following techniques will be studied and practiced: Introduction to optometric examination, Monocular Indirect Ophthalmoscopy, Binocular Indirect Ophthalmoscopy, Biomicroscopic examination of the posterior segment, Binocular subjective refraction, Cycloplegic Refraction, Binocular Balancing tests, Tonometry and Overview of Optometric Examination.

Textbook

1. *Clinical Procedures in Optometry*, J.B. Eskridge, J.F. Amos and J.D. Bartlett.
2. *Optometric Instrumentation*, D. Henson, 1983.
3. *Primary Care Optometry* 3rd Edition, T. Grosvenor, (Published by Butterworth-Heinemann, 1996)

Pre-Requisite

OPTO 363

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 365	Advanced Techniques	1	1	2

Description

This course will introduce the student to further investigation techniques to collect more detailed data about the patient. The following techniques will be studied: Lacrimal studies- TBUT and Schirmer test; Perimetry/Visual Fields; Macular function tests- Photostress/recovery test, Amsler grid, Anterior segment and fundus photography, Correlation of visual complaints with relevant optometric tests, Collation of eye examination results, diagnosis and therapy, Visual complaints and Case Analysis.

Textbook

1. *Clinical Procedures in Optometry*, J.B. Eskridge, J.F. Amos and J.D. Bartlett.
2. *Primary Care Optometry* 3rd Edition, T. Grosvenor, (Published by Butterworth-Heinemann, 1996)
3. *Optometric Instrumentation*, D. Henson, 1983.

Pre-Requisite

OPTO 363

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 375	Anomalies of Binocular Vision	1	1	2

Description

In this second of a two-course series, anomalies and dysfunctions of normal binocular function and skills are discussed. Topics included are: Action of individual extra-ocular muscles, suppression, amblyopia, strabismus, measurement of angle of deviation, fusion problems as well as inability to adequately accommodate, converge and visually track.

Textbook

1. *Binocular Anomalies – Diagnosis and Vision Therapy*, Griffin J.R. and Grishan J.D. (Published by Butterworth-Heinemann, 1995)

Pre-Requisite

OPTO 374

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 377	Visual Science III	2	0	2

Description

Monocular perception of depth, monocular cues such as relative sizes and perspective will be discussed. Stereoscopic perception of depth, retinal correspondence, Veith-Muller horopter, Panum's areas. Psychophysical testing of depth perception and physiology of stereopsis, perception of motion, motion thresholds and illusions, measurement of motion, motion mechanisms. Introduction to color vision using advanced techniques such as ERG's, VEP's etc. the perception of shape, contrast sensitivity channels and measurements. Physiology of visual fields and techniques of measurements, scotomas, thresholds....

Textbook

1. De Valois and De Valois (Published by Oxford University Press, 1998)

Pre-Requisite

OPTO 272

Course No.	Course Title	Credit Hours
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		L	P	T
OPT 394	Geriatric Optometry	2	0	2
Description				

This course is designed to introduce optometry students to problems unique to the geriatric population. Discussions will include the systemic diseases associated with age, the characteristic visual problems as well as social, environmental and other factors affecting them and possible solutions. In addition, the impact of elderly to visual impairment, the psychological adaptation and the situations of psychological disorders will be covered.

Textbook

1. *Vision and Aging: Crossroad for Service Delivery*, Alberta Lorr., 1992.
2. *General Ophthalmology*, Daniel Vaughan, Taylor Asbury and Paul Riordan Eva.

Pre-Requisite

OPTO 344

End of Level 7

Level 8

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 456	Contact Lenses III	1	1	2
Description				

The last of a three-course series in contact lenses reviews contact lens theory, corneal anatomy and physiology with emphasis on clinical application. Lecture topics are: Astigmatism and contact lenses, Introduction to special lens designs (scleral, toric, therapeutic, multifocal), Gas permeable lenses, Lenses for extended wear, Front toric lens fitting, Back toric lens fitting, Bitoric lens design, Bifocal and multifocal lenses-segmented and annular designs-Lenses for aphakia, Fitting Keratoconus, Therapeutic lenses, Contact lens complications.

Textbook

1. *Contact Lens Practice* 1st Edition, Ruben M. and Guillon M., 1994.
2. *Manual of Contact Lens Prescribing and Fitting*, Hom, MM,(Published by Butter-worth-Heinemann, 1997).
3. *Contact Lenses* 4th Edition, Philips A.J. and Speedwell L. (Published by Butterworth, 1997).

Pre-Requisite

OPTO 355

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 466	Optometry Clinic I	0	3	3
Description				

In the first clinical course, optometry students will examine patients and provide refractive care. Under the supervision of faculty optometrists, students will learn to draw upon the information and skills acquired in prior classes to solve visual problems. Additionally, patient management skills will be discussed and developed.

Textbook

1. *Clinical Procedures in Optometry*, J.Boyd Eskridge, J.F. Amos and Jimmy D. Bartlett. (Published by J.b. Lippincott Co., 1991).
2. *Primary Care Optometry* 3rd Edition, Theodore Grosvenor, (Published by Butterworth-Heinemann, 1996).
3. *The Ocular Examination: Measurements & Findings*, K. Zadnik, (Published by W.B. Saunders Co., 1997)
4. *The Optometric Examination: A Clinical Manual*, 3rd Edition, W.S. Long,(Published by W.S. Long, Canada, 1996).

Pre-Requisite

OPTO 365 & OPTO 364

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 491	Optometric Practice	2	0	2

Description

This course is designed to inform the student about various matters relating to opening and operating an optometric office or supervising an optometric clinic. Financial considerations, principles of negotiation, record keeping, patient management, patient communications and managing an office staff, patient education, professional standards, and proposals for services and equipment will also be discussed.

Textbook

1. *Business Aspects of Optometry*, Classe` J.G. et.al., (Published Butterworth-Heinemann,1997)

Pre-Requisite

OPTO 292 & OPTO 364

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 493	Orthoptics	1	1	2

Description

This course is designed to teach the optometry student the methods treatment of binocular problems emanating from visual and oculo-motor inefficiency. Emphasis will be placed on the treatment of: strabismus, amblyopia, suppression as well as convergence, divergence and vergence range problems. The treatment of other visual and oculo-motor problems such as deficit of pursuit, saccades and eye-hand coordination will also be discussed.

Textbook

1. *Clinical Orthoptics*, Fiona Rowe, (Published by Blackwell Science Ltd., 1999).
2. *Diagnosis and management of ocular motility disorders*, Joyce Mein and Brian Harcourt.
3. *Handbook of Orthoptic principles* 4th Edition, Cashell G.T. and Durran I.M., (Published by Churchill Livingstone, 1980).
4. *Atlas of Strabismus* 2nd Edition, Von Noorden G.K. and Maumenee A.E., (Published by C.V. Mosby Company, 1973)

Pre-Requisite

OPTO 375

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 492	Case Analysis	2	0	2
Description				

In this course, analysis of optometric cases will be discussed. Selected cases from optometry clinics will be written up and presented by the student in a concise and professional manner. In a seminar setting each case will be presented for discussion; incorporating the entering complaints, objective and subjective findings, analysis of data, diagnosis and planned course of therapy.

Textbook

1. *Manual of Refraction*, Albert E. Sloan et.al, (Published by Little Brown and Co.)

Pre-Requisite

OPTO 364

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 495	Low Vision	2	1	3
Description				

This course focuses on the etiology, demography and clinical characteristics of low vision, techniques of examination, and the principles of diagnosis and optometric therapy. Clinical applications of magnification, illumination control and visual field enhancement will be studied as well as types and characteristics of low vision aids, social and psychological considerations and multidisciplinary approaches to rehabilitation.

Textbook

1. *Low Vision: Principles and Practice*, Chris Dickinson, (Published by Butterworth-Heinemann, 1998).
2. *Clinical Low Vision*, Faye, (Published by Little Brown Company, 1984).

Pre-Requisite

OPTO 394

End of Level 8

Level 9

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 469	Optometry Clinic II	0	3	3
Description				

This is the second and final clinical course. Under the supervision of faculty optometrist, students will examine more patients in order to acquire more competence.

Textbook

1. *Clinical Procedures in Optometry*, J.Boyd Eskridge, J.F. Amos and Jimmy D. Bartlett. (Published by J.b. Lippincott Co., 1991).
2. *Primary Care Optometry* 3rd Edition, Theodore Grosvenor, (Published by Butterworth-Heinemann, 1996).
3. *The Ocular Examination: Measurements & Findings*, K. Zadnik, (Published by W.B. Saunders Co., 1997)
4. *The Optometric Examination: A Clinical Manual*, 3rd Edition, W.S. Long,(Published by W.S. Long, Canada, 1996).

Pre-Requisite

OPTO 466

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 475	Visual Science Project I and II	0	6	6
Description				

These courses carry three practical credits each, and are designed to introduce the students to research projects. Visual Science Project I is taken in level 8 and II is taken in level 9. Under supervision, a project is proposed, conducted, written up and presented. It may be of any number of formats, however background research, methods, data collection, analysis, presentation and evaluation will be discussed.

Pre-Requisite

OPT 371.

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 496	Occupational Vision	2	0	2
Description				

This course will place special emphasis on the visual, illumination and safety needs of both industrial and office work environment. The prescribing and fitting of safety eyewear, the physical and physiological principles of illumination and occupational vision needs brought about by the widespread use of terminals will be discussed. Control and prevention of ocular injuries in sports and fieldwork will be covered. The vision standards for various occupations and the psychophysical and social implications of visual impairment will be discussed.

Textbook

1. *Industrial and Occupational Ophthalmology*, S. Fox, (Published by Thomas).
2. *The Ophthalmic Assistant*, Stein–Slatt , Stein, 1994.
3. *Foundations of Low Vision: Clinical & Functional Perspectives*, Anne L. Corn & Allan J. Koenig, 1996.

Pre-Requisite

OPTO 491 & 272

Course No.	Course Title	Credit Hours		
		L	P	T
OPT 497	Pediatric Optometry	2	0	2
Description				

This course deals with the pediatric population as a distinct and separate population. Development of the eye and the visual pathway. The importance of early visual assessment. Problems encountered in examining these patients. Alternate methods of examination, assessment of visual acuity, binocularity and refractive status. Patient control and expected or normal findings will be discussed.

Textbook

1. *Assessing Children’s Vision*, Leat S.J., Shute R.H., Westall CA., (Published by Butterworth-Heinemann, 1999)

Pre-Requisite

OPTO 375 & 493

End of Level 9

The internship year

After students finish all the courses successfully, they serve a full year of training in three different hospitals (for a period of four months each) under the supervision of the hospital staff. At the end of each period of training students are assessed by their hospital supervisors.

10. SUB-SPECIFICATIONS OF OPTOMETRY

After graduating and practicing the profession, Optometrists can specialize in one or more of the following fields:

Contact lenses:

Optometrists are the only persons qualified to fit contact lenses, monitor patients who use contact lenses and advise them if problems occur. Continuous professional education provides the means of being up-to-date on the latest advances in contact lens technology (materials, shapes, extended-wear approvals).

Binocular vision:

Serves patients who suffer from strabismus, double vision and amblyopia (“lazy eye”) due to the inability to use the eyes “as a team”. This can be caused by defects in the eye muscles or nerves supplying the eye muscles and might be corrected by special glasses or visual exercises, as well as occlusion therapy. Optometrist may work closely with Orthoptists and Ophthalmologists in this field.

Severe low vision:

Serves patients who suffer from a severe lack of vision which cannot be corrected or improved with normal glasses and contact lenses. The Optometrist will investigate the reason for the loss of visual acuity and prescribe suitable visual aids from range of optical and electronical devices. Optometrists working in this field may work closely with Ophthalmologists and Neurologists in order to prevent further loss in the patient’s visual acuity.

Occupational health:

Serves employees, in particular those working under conditions hazardous to vision (work in factories, welding and melting, exposure to radiation) in order to protect their vision. In such cases special glasses can be described to protect the eyes from injury or increased exposure to visible (e.g. laser) and invisible (IR, UV) radiation. The field of visual ergonomics provides advice to workers in offices or factories on how to use appropriate lighting and avoid glare at their work place and use appropriate optical correction for their working distance to avoid eye strain.

Pediatrics:

Serves children and deals with their common visual problems occurring during maturation of the visual system, such as large refractive error, strabismus and

amblyopia. Visual problems might be corrected by special glasses or visual exercises, as well as occlusion therapy. Optometrist may work closely with Orthoptists and Ophthalmologists in this field.