Paramedical Program

Specialization	**فحص البصر وتجهيز النظارات الطبية**
Course Number	**21111211**
Course Title	**Ocular diseases**
Credit Hours	**(3)**
Theoretical Hours	**(3)**
Practical Hours	**(0)**
Teaching language	**English**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- This course is designed to provide the student with knowledge of the ocular diseases and pathology study and management.

Course Objectives:

Upon the completion of the course, the student will be able to:

1- At the end of this course the students should be able to :
2- Know a principle of general immunology, antigen , antibody .
3- Know general information about inflammation
4- Provide Fundamental framework for understanding the symptoms and signs of different ocular disease
5- Understand the diagnose and management of different ocular disease
6- Provide the students with information about ocular injuries and management .

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	**Principles of general immunology**	▪ Overview of immune response ▪ Antigen- antibody reaction ▪ Mechanism of immune response	
2.	**inflammation**	▪ Introduction of phases of inflammation ▪ Types causes mechanisms	
3.	**Eyelid disease**	▪ Blepharitis meibomionitis eye lid neoplasms benign and malignant causes signs presentation treatment chalasion hordeolum basal cell carcinoma sebaceous carcinoma haemangioma squamous carcinoma lacrimal gland tumours allergic blepharitis bacterial and viral blepharospasm	
4.	**Conjunctival disease**	▪ Types of conjunctivitis causes treatment prophylactic signs symptoms diagnosis differential diagnosis treatment conjunctival masses benign and malignant nevi pterygium pinguecula cysts signs and symptoms therapy trachoma ▪ Neonatal conjunctivitis	
5.	**Corneal disease**	▪ Dystrophies hereditary ▪ keratitis viral bacterial corneal ulcers ▪ bullous keratopathy megalocornea microcornea u-v keratitis ▪ scars dryness recurrent corneal erosions syndrome post surgical cornea odema ▪ keratoconus keratoglobus keratouveitis ▪ Keratomalasia causes signs therapy	
6.	**Lacrimal gland sac and duct disease**	▪ Lacrimal gland tumours daryoadenitis dacryocystitis nasolacrimal duct obstruction canaliculitis punctal malformation dry eye epiphora dacryocele	

7.	**Uveal disease**	▪ Uveal melanoma cyst uveitis types signs causes therapy pars planitis seclusio pupillae iritis iridocyclitis granolumatous and non granolumatous ▪ Uveitis	
8.	**glaucoma**	▪ Classification primary open angle secondary open angle angle closure glaucoma congenital glaucoma infantile glaucoma acute congestive glaucoma phacomatosis	
9.	**Lens disease**	▪ Cataract classification types causes associations treatment aphakia pseudophakia	
10.	**Optic nerve diseases**	▪ ptic atrophy ▪ optic neuritis hypoplasia ▪ Cupping papilloodema ▪ Congenital abnormalities of the optic disc ▪ Toxic optic neuropathy due to alcohol smoking drugs	
11.	**Sclera and orbit**	▪ Episcleritis ▪ Scleritis ▪ Proptosis ▪ Thyroid opthalmic disease ▪ Orbital and preseptal cellulitis	
12.	**Eye Injuries**	▪ Orbit fractures ▪ Cornal abrasion , laceration ▪ Cornal forgeitody ▪ Full thickness Corneal wonnd ▪ Rupture globle ▪ Sub conjunctival haerhage ▪ Chemical Acid, Alcaline ▪ Thermal burn	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	--/--/----
Discussions and lecture Presentations			

Teaching Methodology:

- Lectures
- Slides and posters
- Pratice inside labs

Text Books & References:

Reference

1. Clinical ophthalmology-Kanski, fifth edition
2. Pediatric Ophthalmology – American academy
3. أمراض العين، منشورات كلية الطب جامعة دمشق
4. Manual Of Ocular Diagnosis and Therapy (Deborah pavan -Langston ,MB)
5. American academy lens and cataract
6. American academy inflammation and uveitis
7. Greer's ocular pathology, David R. Lucas

Paramedical Program

Specialization	**فحص البصر وتجهيز النظارات الطبية**
Course Number	**21111231**
Course Title	**Ophthalmic instruments**
Credit Hours	**(3)**
Theoretical Hours	**(3)**
Practical Hours	**(0)**
Teaching language	**English**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- Study of ophthalmic instrument and medical use.

Course Objectives:

Upon the completion of the course, the student will be able to:

1. recognize ophthalmic instrument.
2. recognize medical use of instrument.
3. general knowledge.
4. application

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1	introduction	▪ Definition, instrument use to diagnose of ant. And post. Segment of eye disease, ▪ Instrument use in ophthalmic surgery, type of lenses	
2	Refractometers	▪ Definition, basic principles,operation	
3	Direct and indirect ophthalmoscope	▪ Definition, basic principles, operation, comparison between them.	
4	Keratometer, lensometer,	▪ Definition,indication, optical prism, advantages, disadvantages	
5	microscopes	▪ Definition, principles, images, composition, simple, compound	
6	Slit lamp	▪ Definition, basic principles, operation, accessories, usage.	
7	Orthoptic instruments	▪ Steroscops, maddox rod and wing,amplyescops	
8	Ultrasonography, corneal topography	▪ A/B scan,Definition, ophthalmic use, principles	
9	Visual field peremeter, pyman	▪ Definition, ophthalmic use, principles (manual, automated)	
10	Tonometers, goldman	▪ Definition, ophthalmic use, principles	
11	Retinoscopy, retinometer, low vision aids	▪ Assessment pt, basic optics	
12	Fundus camera and fluorescene angiography	▪ Definition, optical components, illumination, optical principles, observation system	
13	Operating microscope and surgical loops	▪ Definition, observation system, illumination, use of op.mic	
14	Ultrasonography, corneal topography	▪ A/B scan,Definition, ophthalmic use, principles	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	--/--/----
Discussions and lecture Presentations			

Teaching Methodology:

1. Lectures.
2. Group discussion.
3. Videos.
4. Live patterns & samples.
5. Practical applications.
6. Field Visits (Industries).

Text Books & References:

1. text books of clinical ophthalmoptics 1996 cairo
2. clinical optic 1998 f.frank
3. american academic ophthalmology 2005
4. modern ophth. L.dutta 2005
5. text books of clinical refraction
6. edler physiology ophth.
7. secret ophth.
8. clinical ophthalmology kanski

Paramedical Program

Specialization	**فحص البصر والنظارات الطبية**
Course Number	**21111232**
Course Title	**Ophthalmic instruments/ practical**
Credit Hours	**(2)**
Theoretical Hours	**(0)**
Practical Hours	**(6)**
Teaching language	**English**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- Study of ophthalmic instrument and medical use.

Course Objectives:

Upon the completion of the course, the student will be able to:

1. recognize ophthalmic instrument.
2. recognize medical use of instrument.
3. general knowledge.
4. application

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	**Introduction**	▪ Definition, instrument use to diagnose of ant. And post. Segment of eye disease, ▪ Instrument use in ophthalmic surgery, type of lenses	
2.	**Retinoscopy, retinometer**	▪ Assessment pt, basic optics	
3.	**Direct and indirect ophthalmoscope**	▪ Definition, principles, images, comparison	
4.	**Keratometer, lensometer,**	▪ Definition,indication, optical prism, advantages, disadvantages	
5.	**Slit lenses, Lenses, goniolenses**	▪ Definition, principles, components, illumination, reflections. ▪ Diagnostic and medical, prismatic effect, optical lenses	
6.	**Lasers and phototherapeutics**	▪ Definition, phototherapeutics benefits, type of lenses, mechanism of action	
7.	**Refractometers**	▪ Definition, basic principles,operation	
8.	**Orthoptic instruments, prisms, low vision aids**	▪ Steroscops, mudox rod and wing,amplyescops	
9.	**Visual field peremeter,pyman**	▪ Definition, ophthalmic use, principles	
10.	**Tonometers,goldman,automatic visual field**	Definition, ophthalmic use, principles	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	--/--/----
Discussions and lecture Presentations			

Teaching Methodology:

1. Lectures.
2. Group discussion.
3. Videos.
4. Live patterns & samples.
5. Practical applications.
6. Field Visits (Industries).

Text Books & References:

References:

1. **t**ext books of clinical ophthalmoptics 1996 cairo
2. clinical optic 1998 f.frank
3. american academic ophthalmology 2005
4. modern ophth. L.dutta 2005
5. text books of clinical refraction
6. edler physiology ophth.
7. secret ophth.
8. clinical ophthalmology kanski

Paramedical Program

Specialization	**فحص البصر وتجهيز النظارات الطبية**
Course Number	**21111321**
Course Title	**Vision optics**
Credit Hours	**(3)**
Theoretical Hours	**(3)**
Practical Hours	**(0)**
Teaching language	**English**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- The recognition of the geometrical refractive cases of the eye and the study of the accommodation mechanism with glasses and without them.
- The geometrical study of the contact lenses.

Course Objectives:

Upon the completion of the course, the student will be able to:

1- The recognition of the geometrical refractive cases of the eye and to derivate to the mathematical differential which determines the object and the dimensions of the picture and the objects.
2- The study of the adaptation mechanism with glasses and without them
3- The study of the geometrical and mathematical concept to the contact lenses on the eye; the comparison between the glasses and the contact lenses, in addition to the comparison between the soft and hard spherical lenses and the suitable substitution .

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	**introduction**	▪ Definition, classification, cornea, lenses, ant. chamber,cardinal points of eye, lenses system, optics and aberration system.	
2.	**Emetropia, ametropia the ametropic eye.**	▪ Definition, classification, myopic system, hypermetropia,astigmaisim,prisbiobia,amplobia,anisometropia,aphaikia	
3.	**Refraction of the eye**	▪ Definition, classification, bioptic system,bioptic lens, anisometropia, anisokinia	
4.	**Optical system of the eye**	▪ Definition, classification, refraction therapy, applications, myopic system, hypermetric system, aphakia	
5.	**Retinal image**	▪ Definition, classification, introduction, refractions errors, emothropic eye prism, a box, camera	
6.	**Aberration of optical system**	▪ Definition, classification, aberrations, optical system, spherical system, chromatic system, cornea aberrations, aberration of the eye, chromatic spherical aberration, coma aberration…etc	
7	**Accommodation and its disturbances**	▪ Definition, classification, emetropia, types of accommodation, mechanism, amplitude and range of accommodation, far and near points, catoptric image. anomalies of accommodation	
8	**Binocular muscular coordination**	▪ Definition, classification, orthophoria, binocular vision, conversions, relation between conversions and accommodation	

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

9	**Intraocular lens**	▪ Introduction, Definition, classification, osmolarity, power cal. ,fitting	
10	**Spectacle magnification**	▪ Definition, calculations of spectacle and relative spectacle magnifications, image formation.	
11	**Visual field**	▪ Definition, anomalies of visual field, prechaiasmal defect and post chaiasmal defect, clinical assessment, glaucoma.	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	--/--/----
Discussions and lecture Presentations			

Teaching Methodology:

1. Lectures.
2. Discussion & Quizzes.
3. Homeworks

Text Books & References:

References:

1- D. Aumer Alshek (مقدمة للبصريات الكلاسيكية والحديثة)
مؤسسة الشومان – مجمع اللغة العربية الأردني 1983 نقل المراجع بالانجليزية مع الأصل

Paramedical Program

Specialization	**فحص البصر وتجهيز النظارات الطبية**
Course Number	**21111212**
Course Title	**Strabismus**
Credit Hours	**(3)**
Theoretical Hours	**(3)**
Practical Hours	**(0)**
Teaching language	**English**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- This course is designed to provide the student with an applied and manageable knowledge about strabismus , definition diagnose and management.

Function and anatomy of extra ocular muscles.

Course Objectives:

Upon the completion of the course, the student will be able to:

1. Define the strabismus
2. Provide background of anatomy and physiology of the extra ocular muscles and ocular movements
3. Understand the clinical evaluation of strabismus.
4. Provide information about different types of strabismus.
5. Provide information about management and diagnose different types of strabismus.
6. Understand special types of strabismus.
7. Understand amblyopia and nystagmas.

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	**Anatomy of extra ocular muscle**	▪ Origin and insertion of each extra ocular muscle ▪ Primary and secondary action of each extra ocular muscle ▪ Innervations and blood supply of each extra ocular muscle	
2.	**Physiology of extra ocular muscle**	▪ Horopter ▪ Fusion Vergence ▪ Panum area ▪ Suppression ▪ Yoke muscles ▪ Agonist and antagonist muscles ▪ Laws of innervations ▪ Sherington law ▪ Herring Law ▪ Mono ocular vision ▪ Bino ocular vision	
3.	**Motor tests**	▪ Near point of convergence ▪ Near point of accommodation ▪ Synaptophere ▪ Amblyoscope ▪ Cover test ▪ Maddox rod ▪ Hirschberg test	
4.	**Sensory test**	▪ Worth four dot ▪ Bagolini straited glasses ▪ After image	
5	**Strabismus classification**	▪ Definition ▪ classification ▪ Accommodative esotropia ▪ Retractive accommodative ▪ Fully accommodative	

		▪ Partially accommodative ▪ Non Refractive accommodative Esotropia such as convergence excess ▪ Non accommodative esotropia such as, essential infantile esotropia, microscopic , basic esotropia .	
6	**Exotropia**	▪ Definition ▪ Classification constant exotropia ▪ Intermittent exotropia	
7	**Vertical strabismus**	▪ Definition ▪ Classification ▪ treatment	
8	**Paralytic strabismus**	▪ Definition ▪ Causes such as six nerve palsy and third nerve palsy ▪ Diagnose and management	
9	**Nystagmus**	▪ Definition ▪ Classification ▪ Causes and management	
10	**Special types of strabismus**	▪ Duane syndrome ▪ Brown syndrome	
11	**Functional consequences of strabismus**	▪ Amblyopia ▪ classification ▪ Definition and management ▪ Confusion and diplopia	
12	**Management of strabismus**	▪ Refraction ▪ Occlusion ▪ Orthoptics ▪ Surgery	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	--/--/----
Discussions and lecture Presentations			

Teaching Methodology:

1. Lectures
2. Slides and posters
3. Practice inside labs

Text Books & References:

References:

1. Clinical ophthalmology-Kanski, fifth edition
2. Pediatric Ophthalmology – American academy
3. أمراض العين، منشورات كلية الطب جامعة دمشق
4. Manual Of Ocular Diagnosis and Therapy (Deborah pavan -Langston ,MB)

Paramedical Program

Specialization	**فحص البصر وتجهيز النظارات الطبية**
Course Number	**21111331**
Course Title	**Clinic techniques**
Credit Hours	**(3)**
Theoretical Hours	**(3)**
Practical Hours	**(0)**
Teaching language	**English**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- To present the essential principles of the theory of the correction of defects in the optical system of the eyes and their associated muscles.

Course Objectives:

Upon the completion of the course, the student will be able to:

1. Obtain good knowledge of the theory of clinical methods.
2. Differenciate between refractive errors and organic diseases.
3. Obtain the skills of using ophthalmic instrument.
4. Know modern methods for evaluation of eye diseases.
5. Practice all of the above

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	EXAMINATION OF THE EYE AND REFRACTION OF LIGHT	▪ Medical history; external inspection, face, skin diseases, Eyelids, eye movement, redness, corneal opacities, tearing, exophthalmoses، causes and measurement، Measurement of intraocular pressure، ▪ Examination of ant. Segment by slit lamp. - Examination of posterior segment by direct ophthalmoscope indirect ophth. Additional lenses ,filters ▪ Examination of visual acuity :definition ,methods And units for far and near measurement، Snellin ,landolt charts The Sheridan-gardiner test -Visual field :methods and instrument for evaluation Amsler grid Autorefractometer- -color perception, color blindness،-examination. ▪ Accommodation: near and far point Mechanism, ,prespyopia، Bifocal and mult yifocal lenses ▪ Binocular single vision	
2.	REFRACTION UNDER CYCLOPLEGI-	▪ introduction to pharmacology −general principles of drug action	

❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

	CS	−routes of drug administration −dosage ▪ Eye pupil dilators: −adrenalin, noradrenalin, phenylephrine, naphazoline Mode of action, effects, uses, contraindication -atropine, homatropin، ▪ EYE PUPIL CONSTRICTORS −Pilocarpine, carbachol, acetylcholine ▪ CYCLOPLEGICS− − Atropine: Action in the eye, side effects Homatropin ، cyclopentolate , hyosine , tropic amid ▪ RETINOSCOPY AND OPTTHALMOSCOPY UNDER CYCLOPLEGICS − Optics of retinoscopy −retinoscopy in emmetropia , myopia , hypermetropia , astigmatism ▪ THE PRESCRIPTION OF GLASSES	
3.	**DISEASES OF THE EYE**	▪ Blepharitis , chalazion , entropion , ptosis Lagophthalmos watering eye، dacryocystitis Bacterial, viral, angular conjunctivitis ، Trachoma, allergic conjunctivitis,sprig catarrh , Keratitis ، iridocyclitis ، cataract, Congenital ,open angle ,closed angle glaucoma . Vascular disorders of the retina Retinal detachment	

		, Diabetic retinopathy	
4.	**BINOCULAR VISION AND ITS ANOMALIES**	▪ Anisometropia. ▪ Aniseikonia – Binocular muscular coordination – orthophoria –heterophoria –heterotropia –Convergence –ocular motility ▪ latent strabismus –evaluation of duction and version Movement –diplopia –paretic strabismus -accommodative esotropia -Amlyopia –Nystagmus	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	--/--/----
Discussions and lecture Presentations			

Teaching Methodology:

1. Lectures.
2. Group discussion.
3. Videos.
4. Live patterns & samples.
5. Practical applications.
6. Field Visits (Industries).

Text Books & References:

References:

1. Andrew R Elkigton 1999 Clinical Optics,third edition,Blackwell Scientific Publication
2. Duke Elders Practice of Refraction,1993,tenth edition
3. Jack j. Kanski,2003,Clinical Ophthalmology. Butterworth Heinemann fifth edition
4. American Academy of Ophthalmology,section 3,2003-2004,LEO
5. Rowe,Fiona j 1997 Clinical Orthoptic,first edition Blackwell Science

Paramedical Program

Specialization	**فحص البصر وتجهيز النظارات الطبية**
Course Number	**21111332**
Course Title	**Clinic techniques/ practical**
Credit Hours	**(2)**
Theoretical Hours	**(0)**
Practical Hours	**(6)**
Teaching language	**English**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- To present the practice of the correction of defects in the optical system of the eyes and their associated muscles.

Course Objectives:

Upon the completion of the course, the student will be able to:

1. Differenciate between refractive errors and organic diseases.
2. Obtain the skills of using ophthalmic instrument.
3. Know modern methods for evaluation of eye diseases.
4. Practice all of the above

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	EXAMINATION OF THE EYE AND REFRACTION OF LIGHT	▪ Medical history; external inspection, face, skin diseases, Eyelids, eye movement, redness, corneal opacities, tearing, exophthalmoses، causes and measurement، ▪ Examination of ant. Segment by slit lamp. - Examination of posterior segment by direct ophthalmoscope indirect ophth. Additional lenses ,filters ▪ Examination of visual acuity :definition ,methods And units for far and near measurement، Snellin ,landolt charts The Sheridan-gardiner test -Visual field :methods and instrument for evaluation Amsler grid Autorefractometer- -color perception, color blindness،-examination. ▪ Binocular single vision	
2.	Refraction	▪ RETINOSCOPY AND OPTTHALMOSCOPY UNDER CYCLOPLEGICS − Optics of retinoscopy −retinoscopy in emmetropia , myopia , hypermetropia , astigmatism ▪ THE PRESCRIPTION OF GLASSES	

❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

3.	**Use the slit lamp in diagnosis**	▪ Blepharitis , chalazion , entropion , ptosis Lagophthalmos watering eye، dacryocystitis Bacterial, viral, angular conjunctivitis ، Trachoma, allergic conjunctivitis,sprig catarrh , Keratitis ، iridocyclitis ، cataract, Congenital ,open angle ,closed angle glaucoma . Vascular disorders of the retina Retinal detachment , Diabetic retinopathy	
4.	**BINOCULAR VISION AND ITS ANOMALIES**	▪ Anisometropia. ▪ Aniseikonia − Binocular muscular coordination − orthophoria −heterophoria −heterotropia −Convergence −ocular motility ▪ latent strabismus −evaluation of duction and version Movement −diplopia −paretic strabismus -accommodative esotropia -Amlyopia −Nystagmus	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	--/--/----
Discussions and lecture Presentations			

Teaching Methodology:

7. Lectures.
8. Group discussion.
9. Videos.
10. Live patterns & samples.
11. Practical applications.
12. Field Visits (Industries).

Text Books & References:

References:

5. Andrew R Elkigton 1999 Clinical Optics,third edition,Blackwell Scientific Publication
6. Duke Elders Practice of Refraction,1993,tenth edition
7. Jack j. Kanski,2003,Clinical Ophthalmology. Butterworth Heinemann fifth edition
8. American Academy of Ophthalmology,section 3,2003-2004,LEO
9. Rowe,Fiona j 1997 Clinical Orthoptic,first edition Blackwell Science

Paramedical Program

Specialization	**فحص البصر وتجهيز النظارات الطبية**
Course Number	**21111221**
Course Title	**Refractive errors**
Credit Hours	**(3)**
Theoretical Hours	**(3)**
Practical Hours	**(0)**
Teaching language	**English**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- To study the refractive errors in different classification, diagnosis and management.

Course Objectives:
Upon the completion of the course, the student will be able to:

1- Diagnose the myopia, hypermetropia, and astigmatism.
2- To treat the different types of refractive errors.
3- To know the anisometropia and the importance of its treatment.
4- To know the amblyopia.
5- To know the new methods of treatment of refractive errors (refractive surgery).

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	**Myopia**	▪ Definition of emmetropia ▪ Definition of myopia ▪ Classification of myopia ▪ axial myopia ▪ Index myopia ▪ Definition of high myopia ▪ Pathological changes of high myopia ▪ Diagnosis and management of myopia	
2.	**Hypermetropia**	▪ Definition classification ▪ axial ▪ index (Refractive) ▪ other classification ▪ Manifest ▪ Latent ▪ Facultative ▪ Absolute ▪ Diagnosis and management	
3.	**Aphakia**	▪ Special type of hypermetropia ▪ Optical problems in correcting aphakia with spectacles ▪ Different methods of treatments of aphakia	
4.	**Astigmatism**	▪ Definition ▪ classification ▪ Regular ▪ Irregular ▪ Other Classification ▪ Depends on image position relative to retina ▪ Diagnose and management	

5.	**Persbyopia**	▪ Definition pf accommodation ▪ Definition of presbyopia ▪ Onset of Persbyopia ▪ Persbyopia in myopia, hypermetropia, emmetropia ▪ calculation of presbyopic correction ▪ complaining of the patient ▪ Diagnose and management	
6.	**Amblyopia**	▪ Definition ▪ causes ▪ Diaghosis ▪ Management ▪ Anisometropia ▪ Definition ▪ It is associated with Amblyopia	
7.	**Keratoconus**	▪ Definition ▪ Classifications ▪ Causes and treatment	
8.	**Refractive tests**	▪ Pin hole test ▪ Stenopaeic slit ▪ Jaxon cross cylinder ▪ Duochrome test	
9.	**Refractive surgery**	▪ Indication ▪ Contra indication ▪ Correction of myopia ▪ Different methods of treatment of myopia ▪ Radial Keratotomy ▪ lasix(Laser in Situ ketratomileusis) ▪ P.R.k ▪ instrastromal ring ▪ Correction of hypermetropia ▪ PRK (Photo Refractive Keratotomy)	

		▪ Lasix ▪ correction of Astigmatism ▪ Arcaute keratotomy of Astigmattism ▪ P.R.k ▪ lasix ▪ Complication of different methods of refractive surgery ▪ complication of lasix ▪ complication of P.R.K	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	--/--/----
Discussions and lecture Presentations			

Teaching Methodology:

1- Lectures.
2- Discussion and quizzes.
3- Demonstration and practical training

Text Books & References:
References:

1. Clinical ophthalmology Kanski fifth edition 2003
2. Pediatric ophthalmology – American Academy 2004
3. Clinical optics (Elkington) third edition
4. أمراض العين منشورات جامعة دمشق / كلية الطب 2004-2005

Paramedical Program

Specialization	**فحص البصر وتجهيز النظارات الطبية**
Course Number	**21111121**
Course Title	**Geometric optics 1**
Credit Hours	**(3)**
Theoretical Hours	**(3)**
Practical Hours	**(0)**
Teaching language	**English**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- The student has to study nature of light, kinds of reflections and refractions ,plane and spherical mirrors, lenses and formation of images, thin, compound and thick lenses, dispersion ,prisms, and aberrations.

Course Objectives:

Upon the completion of the course, the student will be able to:

1. know about the nature of light .
2. distinguish between kinds of reflections on plane or spherical mirrors.
3. distinguish between refractions at thin and thick lenses.
4. know the focal length of compound lenses.
5. know dispersion , aberration .
6. apply on optical instruments.

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	**Light: nature and its speed.**	• Theories that explain light nature • Light spread and light properties	
2.	**Reflection of light in plane mirror**	▪ regular and irregular reflection. ▪ The two laws of the regular reflection. ▪ Images in the plane mirror. ▪ System of two plane mirrors.	
3.	**reflection in spherical mirrors:**	▪ the General law of spherical mirrors. ▪ The nature of images in the concave mirror. ▪ Images in the convex mirror.	
4	**Refraction of Light**	▪ The two laws of the refraction. ▪ Snell's law. ▪ Critical angle and total (internal) reflection. ▪ Fiber optics.	
5.	**Prism and Dispersion**	▪ Prism Equation. ▪ Dispersion of Light. ▪ Dispersive power. ▪ Normal dispersion	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	--/--/----
Discussions and lecture Presentations			

Teaching Methodology:

1. Discussion.
2. practical training.
3. Reports

Text Books & References:
References:

1- Dc.O'shea .WR callen and WT .Rhodes 1990
2- Introduction to laser and their application ,Addison Wesley
3- D.Svelto 1998
4- Principle of lasers 4th edition press New York
5- G.T Absten and S.N joff 1990 Laser in Medicine Chapman and hall
6- MontoRoss .Lasers applications volumes 1971
7- volume 2 and 3 1977 Academic press
8- Tarasov L.V 1998 laser Age in optics
9- 3rd edition second print
10- د.سهام عفيف قندلا ،الطبعة الثالثة 1997 الليزر الاسس الفيزيائية و بعض التطبيقات العملية

Paramedical Program

Specialization	**فحص البصر وتجهيز النظارات الطبية**
Course Number	**21111223**
Course Title	**Geometric optics 2**
Credit Hours	**(3)**
Theoretical Hours	**(3)**
Practical Hours	**(0)**
Teaching language	**English**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- The student has to study nature of light, kinds of reflections and refractions ,plane and spherical mirrors, lenses and formation of images, thin, compound and thick lenses, dispersion ,prisms, and aberrations.

Course Objectives:
Upon the completion of the course, the student will be able to:

7. know about the nature of light .
8. distinguish between kinds of reflections on plane or spherical mirrors.
9. distinguish between refractions at thin and thick lenses.
10. know the focal length of compound lenses.
11. know dispersion , aberration .
12. apply on optical instruments.

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	**Thin Lenses**	▪ Definitions. ▪ Images formed by a spherical surface between two transparent surfaces. ▪ The lens-maker's Equation. ▪ Thin lenses' equation. ▪ Images in thin lenses	
2.	**Compound thin lenses and thick lenses**	▪ Equivalent focal length of two thin lenses separated by a finite distance. ▪ Cardinal points. ▪ Refraction through a thick lenses	
3.	**Aberrations**	▪ General theory. ▪ Spherical Aberration. ▪ Coma ▪ Astigmatism ▪ Curvature of field ▪ Distortion ▪ Chromatic Aberration.	
4.	**Magnification**	▪ Visual angle ▪ Simple microscopes ▪ Compound microscopes ▪ Telescopes and its types	
5.	**Camera and projection instruments and hologram**	▪ Camera functional principal ▪ Overhead projection functional principal ▪ Slide projection functional principal ▪ Hologram theories and principle ▪ The different between holography and photography	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	--/--/----
Discussions and lecture Presentations			

Teaching Methodology:

4. Discussion.
5. practical training.
6. Reports

Text Books & References:
References:

11-Dc.O'shea .WR callen and WT .Rhodes 1990
12-Introduction to laser and their application ,Addison Wesley
13-D.Svelto 1998
14-Principle of lasers 4th edition press New York
15-G.T Absten and S.N joff 1990 Laser in Medicine Chapman and hall
16-MontoRoss .Lasers applications volumes 1971
17-volume 2 and 3 1977 Academic press
18-Tarasov L.V 1998 laser Age in optics
19-3rd edition second print
20- د.سهام عفيف قندلا ،الطبعة الثالثة 1997 الليزر الاسس الفيزيائية و بعض التطبيقات العملية

Paramedical Program

Specialization	**فحص البصر وتجهيز النظارات الطبية**
Course Number	**21111224**
Course Title	**Glasses preparation**
Credit Hours	**(3)**
Theoretical Hours	**(3)**
Practical Hours	**(0)**
Teaching language	**English**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- This course is designed to study the materials used in manufacturing the optical lenses, their characteristics, manufacturing methods, measuring the lens power, prismatic effect, the decentration of the center of lens , edge thickness

This course is designed to study the required measurements of the face to choose the suitable frame and to study the lense shapes, types and uses.

Course Objectives:

Upon the completion of the course, the student will be able to:

1. Recognition of the characteristics of different chemical materials necessary for the manufacturing the lenses.
2. To study the types of lenses and quality of the used materials.
3. using the suitable lenses and the accurate power measuring the different types of lenses and prisms
4. To study the types of the materials used in the frame .
5. To study the bifocal and mutifocal lenses and their uses.
6. To recognition of special cases of the medical prescription.

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	**Lens materials**	▪ Introduction. ▪ crown glass ▪ Plastic (CR 3a) ▪ High index glass ▪ High index plastic ▪ Polycarbonate lenses. ▪ Photochromic lenses (glass and plastic)	
2.	**The measurements**	▪ The measurements ▪ Boxing system. ▪ Datum system. ▪ face measurements necessary for the preparation of the glasses ▪ Pantoscopic angle. ▪ using the rulers and equipment to measure the frame .	
3.	**Types of lenses**	▪ Introduction. ▪ Spherical lenses. ▪ Sphero – cylinder lenses. ▪ Toric lenses.	
4.	**The methods of smoothing and polishing the lenses.**	▪ Introduction. ▪ Choosing the suitable equipment for the test curvature (according to the power) ▪ Required equipments for smoothing the lenses ▪ General recognition of the smoothing instruments ▪ Examining the lenses after the smoothing	
5.	**Lensmeter and**	▪ Introduction	

	lens measure	▪ Composition of the lensmeter. ▪ Work principle of the lensmeter and derivation neuton equation ▪ Types of the lensmeter ▪ Using the lensmeter to measure the power of spherical or sherocylindrical. ▪ Measuring the distance between the lenses centers	
6.	**The power of the surface, the radius of the curvature and the refractive index.**	▪ The principle of the lens measure instrument ▪ The radius of curvature(its concept and derivations). ▪ Refractive index (it's concept, importance and derivations) ▪ Surface power (mathematical equation and calculation)	
7.	**the basic conversion of optical lenses (transposition)**	▪ Perpendicular cylindrical lenses. ▪ Sphero-cylindrical lenses (from plus cylinder to minuce cylinder and vice versa) ▪ Toric lenses conversion. ▪ Questions and solutions	
8.	**Writing the lenses formation**	▪ Biconvex lenses ▪ Plano convex lenses. ▪ Plano concave lenses ▪ Meniscus lenses. ▪ The Best form of lenses to avoid the aberration	
9.	**Power of the back surface of the lens and the back vertex distance**	▪ The importance of the back vertex distance and its effect on the lens power ▪ Derivation of the mathematical equations ▪ Questions and solutions.	
10.	**the prismatic effect in the lenses**	▪ Derivation of the prismatic effect equation. ▪ Applying the equation in plus and minus	

		lenses ▪ Prism displacement formula (the relation between the displacements lenses and the prismatic effect ▪ the prismatic errors which are acceptable	
11.	**cutting and carving the lenses**	▪ Introduction. ▪ Choosing the wanted lenses and examining them by light to discover the defects ▪ Measuring the lenses and marking the center and the axis by the lens meter . ▪ Cutting the required frame ▪ Displacement of the center of lens to suit the frame and the papillary distance ▪ Manual carving ▪ Automatic carving ▪ The bevel ▪ Fitting the lenses on the frame	
12.	**the Frame materials , characteristics and methods of manufacturing nd frame parts**	▪ plastic Frames ▪ metal Frames ▪ silicon Frames for the children ▪ study the different parts of the frame	
13.	**bifocal and multifocal lenses**	▪ practical needs for these lenses ▪ disadvantages of these lenses ▪ required measurements for fixing theses lenses in the Frame correctly ▪ studing the anisometropia cases and their correction with these lenses ▪ characteristics of the required Frames when we choose these lenses	
14.	**colored lenses and coating layers,coating for absorbing the ultra-violet rays**	▪ their absorbability of the light characteristics -method of use -anti-scratch coating, it's importance and effect -anti reflexion coating	

	(u.v)	-reflexion types in the lenses -derivation of the reflection index -the importance of reflection coating generally and especially for the high reflection index lenses -work principle of theses coating and the conditions of choosing the proper material -the methods of preparing coating	
15.	**high power lenses.**	▪ disadvantages of high power lenses ▪ Choosing the frame and preparation limitation according to type of the lenses and the refractive errors ▪ effect of the magnification and minimizing of image and pictures, which requires attention to the style and shape of the lenses	
16.	**the special glasses**	▪ telescopic glasses glasses for fixing the artificial eyes protective glasses form rays and scattered bodies magnifying lenses	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	--/--/----
Discussions and lecture Presentations			

Teaching Methodology:

1. Lectures.
2. Discussion & Quizzes.
3. Demonstration & Practical training.

Text Books & References:
References:

1. L.S.Sasiei, The Principles & Practise of optical Dispensing & Fitting(London:Butterworths,1975)
2. Arthur G.Bennett,othalmic Precsription work ,(London:Butterworths,1988).
3. Stewart Duke Elder,practice of Refr,action,London.

Paramedical Program

Specialization	**فحص البصر وتجهيز النظارات الطبية**
Course Number	**21111111**
Course Title	**Ocular anatomy**
Credit Hours	**(3)**
Theoretical Hours	**(3)**
Practical Hours	**(0)**
Teaching language	**English**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- To study the main structural features of different orbital and eyeball parts with detailed structural study of parts involved in normal eye.

Course Objectives:

Upon the completion of the course, the student will be able to:

1. Name the orbital contents and adnexa.
2. Describe the eyeball structure.
3. Describe in detail the physical and optical properties of each of the refractive media of the eye.

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	**Introduction**	▪ Periorbital air sinuses ▪ The bony orbit ▪ Contents of the orbit ▪ Topographic features of the globe ▪ Coats of the globe ▪ scleral openings ▪ Ligaments	
2.	**Orbital Adnexa**	▪ Extraocular muscles ▪ Eye lids ▪ Lacrimal glands(main and accessory) ▪ lacrimal drainage system ▪ Conjunctive and Tenon's capsule ▪ Vessels of the eye and orbit	
3.	**Refractive Media of The Eye**	▪ Precorneal tear film. ▪ The Cornea ▪ The aqueous humor ▪ The lens ▪ The vitreous	
4.	**Coats of the Eye**	▪ The sclera ▪ The Uveal tract ▪ The retinal pigment Epitheliums ▪ The Neurosensory retina ▪ The visual cycle. ▪ Electrical phenomena in the retina	
5.	**Nerves of the Orbit and Eye**	▪ Cranial nerves: II ,III, IV, V, VI, VII and VIII ▪ The Ciliary ganglion ▪ The visual pathways ▪ The visual cortex ▪ Formation of images in the retina and ▪ cortical interpretations	

6.	**Ocular Embryology**	▪ Growth factors ▪ Homeobox genes ▪ Neural crest cells ▪ Embryonic tissues ▪ Early eye development ▪ Development of the lens ,Retina, and ▪ Urea ▪ Remnants of embryonic tissues in the eye	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	--/--/----
Discussions and lecture Presentations			

Teaching Methodology:

1. Lectures assisted by direct drawing.
2. Demonstrations on models.
3. Student assignments.
4. Group discussion.
5. Quiz.

Equipment:

1. Slide Projector
2. Overhead Projector
3. Blackboard
4. Models

Text Books & References:
References:

1. ADLER's Physiology of the eye, Clinical Applications, The C.V. Mosby Company 2002.
2. The EYE Basic Science in Practice, W B Saunders Company Ltd.
3. Basic and Clinical Science Course, Section 2.
4. Fundamentals and principles of ophthalmology, American Academy of Ophthalmology 2006.

Paramedical Program

Specialization	**فحص البصر وتجهيز النظارات الطبية**
Course Number	**21111112**
Course Title	**Ocular physiology**
Credit Hours	**(2)**
Theoretical Hours	**(2)**
Practical Hours	**(0)**
Teaching language	**English**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- To study the functional importance of different orbital and eyeball parts with detailed functional study of parts involved in normal eye visual functions.

Course Objectives:

Upon the completion of the course, the student will be able to:

1. describe the functions and/or actions of each structure of the eye.
2. Describe the eyeball functional importance of each part.
3. Describe in detail the processes and mechanisms involved in normal visual functions.

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	**Eye movement**	▪ Extraocular muscles functions (primary, secondary, tertiary) ▪ Types of eye movement ▪ Vergence types ▪ Nystagmus	
2.	**Blood Circulation of the eye**	▪ Arteries and veins ▪ Blood retinal barrier ▪ O2 concentration	
3.	**Intraocular pressure**	• Definition • Formation of aquoes humer and its drainage • Factors affected IOP • Maintenance of IOP	
4.	**Accommodation**	▪ Definition ▪ Importance ▪ Mechanisms ▪ Amplitude of accommodation ▪ The relation between the accommodation and and the convergence ▪ myopia	
5.	**Ocular adnexia functions**	▪ eyelids (importance, secretions of glands, special movements, inervation, Bell's phenpmena) ▪ lacrimal system (function, tears secretion, dry eye)	
6.	**Transparent ocular structures**	▪ corneal characteristics, biochemistry, transparency, permeapility) ▪ aqueous humor (formation, compositions, functions, circulation, drainage, physical properties) ▪ vitrueous humor (formation, composition, function, physical properties, metabolism) ▪ crystalline lens (physical and chemical	

		properties, water permeability, metabolism, opacities and its causes) ▪ pupil (iris innervations, light reflex, tonic pupil, Adie's pupil, hurner pupil, Argyl Robertson's pupil, pupil constriction and dilation)	
7.	**The retina**	▪ metabolism ▪ innervations ▪ nutrition ▪ function: gangilion cells, bipolar cells, horizontal cells, amecrine cells, muller cells functions ▪ dark adaptation ▪ rods and cones functions ▪ ERG and EOG	
8.	**Binocular single vision**	▪ Definition ▪ Coordination ▪ Motor and sensory Fusion ▪ Panum's area ▪ Horopter ▪ Stereopsis ▪ Suppression	
9.	**Visual functions**	▪ Visual acuity ▪ Threshold ▪ Color vision ▪ Visual field	
10	**General health**	▪ Nutrition ▪ Illumination ▪ Prespiopia ▪ Alcohols	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	--/--/----
Discussions and lecture Presentations			

Teaching Methodology:

6. Lectures assisted by direct drawing.
7. Demonstrations on models.
8. Student assignments.
9. Group discussion.
10. Quiz.

Equipment:

5. Slide Projector
6. Overhead Projector
7. Blackboard
8. Models

Text Books & References:
References:

1. ADLER's Physiology of the eye, Clinical Applications, The C.V. Mosby Company 2002.
2. The EYE Basic Science in Practice, W B Saunders Company Ltd.
3. Basic and Clinical Science Course, Section 2.
4. Fundamentals and principles of ophthalmology, American Academy of Ophthalmology 2006.

Paramedical Program

Specialization	**فحص البصر وتجهيز النظارات الطبية**
Course Number	**21111226**
Course Title	**Contact lenses 1**
Credit Hours	**(3)**
Theoretical Hours	**(3)**
Practical Hours	**(0)**
Teaching language	**English**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- Study of different types of contact lenses, manufacturing processes, disinfection, and their sides effects.

Course Objectives:

Upon the completion of the course, the student will be able to:

1. Study of contact lenses and their uses to correct refractive errors and therapeutic uses.
2. The importance of contact lenses cleaning and disinfection.
3. Study of different types of contact lenses, their advantages and disadvantages.
4. Contact lenses insertion and removal.
5. Contact lens effects on the eye.

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	**Different types of contact lenses**	▪ The history of contact lenses and their development. ▪ Javal Shiotz Keratometer and its importance in contact lens development ▪ The primary contact lens (glass contact lenses) ▪ Plastic contact lenses ▪ Soft contact lenses ▪ Gas permeable contact lenses ▪ Contact lenses nowadays.	
2.	**Contact lenses optics and parameters**	▪ The effect of wearing contact lenses on the cornea ▪ The curvature of contact lenses and its importance. ▪ Oxygen permeability through the lens and its importance. ▪ Corneal contact lenses. ▪ scleral contact lenses ▪ semi-scleral contact lenses. ▪ Different types of contact lenses: - spherical - Toric - Elliptical - Contact lens parameters: - base curve - anterior radius of curvature - Power -size ▪ Some instruments which are useful in contact lens fitting.	

3.	**Contact lenses classifications**	▪ According to size: –corneal – scleral – semi –scleral ▪ According to its material: –soft –rigid gas permeable – hard ▪ advantages and disadvantages for every type. ▪ Basic measurements for contact lens fitting and how to write it. ▪ Oxygen permeability in soft and rig permeable contact lenses.	
4.	**Keratometer and other instruments which is used in contact lens fitting**	▪ The importance of lens curvature ▪ contact lenses effects on corneal curvatu ▪ using contact lenses in cases of keratoco ▪ slit lamp ▪ Fluorescein usage	
5.	**Selecting contact lenses**	▪ prescription analysis, myopia,hyp astigmatism and patient;s accommodati glasses especially in hyperopia. ▪ care and cleaning of contact lens by the p ▪ patient's occupation ▪ patient's intelligence ▪ patient's environment ▪ contact lens indications ▪ contact lens contraindications ▪ contact lens fitting by a specialist.	
6.	**Corneal/ residual astigmatism**	▪ How to measure the corneal and astigmatism ▪ how to manage them by contact lenses ▪ toric contact lenses types:	

		▪ front toric – bitoric – back toric	
7.	**Contact lens fitting**	▪ Examination procedures in contact lens fitting ▪ lens fitting and verification ▪ fitting possibilities: –flat fit –steep fit – ideal fit ▪ using Fluorescein in contact lens fitting	
8.	**Contact lenses cleaning and disinfection**	▪ Contact lens cleaning to remove wastes and microorganisms. ▪ solutions used for every type of contact lens. ▪ The importance of: – cleaning – washing –disinfection – protein removal	
9.	**Handling contact lenses**	▪ contact lens insertion and removal ▪ eyelids muscles role in contact lens insertion and removal. ▪ correct way in handling soft contact lensto avoid tearing. ▪ plunger usage only in special cases.	
10.	**contact lens complications**	▪ The best care for contact lenses: ▪ Disinfection – cleaning –insertion – removal ▪ inflammations and allergies, solutions allergies ▪ over uses for contact lenses – hypoxia – wrong fitting	

		▪ redness: causes, how to avoid it. ▪ planned follow with contact lens specialist ▪ stop wearing contact lenses if any complication appears.	
11.	**Monovision correction**	▪ Using contact lenses rather than spectacles in case of anisometropia. ▪ back vertex distance. ▪ Extended wear contact lenses. ▪ advantages ▪ disadvantages especially in hot climates ▪ cosmetic contact lenses and tinting methods	
12.	**anatomy and physiology of the outer layers**	▪ anatomy of the cornea --epithelium and endothelium rule for contact lens. ▪ Cornal metabolism ▪ importance or oxygen for healthy cornea. ▪ tear film composition and its rule. ▪ contact lens effects on the tear film ▪ role of eyelids and conjunctiva for contact lens.	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	
Discussions and lecture Presentations			

Teaching Methodology:

1. Lectures.
2. Demonstrations and Homeworks.
3. Discussion & Quizzes.

Text Books & References:
References:

1 .stone & philips , contact lenses Butterth group:(Asbelow) 1984.
2. J .D. Spooner, Ocular Anatomy, Butterth group:Butterth &Co.(Pulishi shers) London :88 Kingsway, WC2B 6AB 1977.
3. H . Obstfeld, Optics in vision, Butterth group:(As above)1978 .
4. العدسات اللاصقة، د.سرى سبع العيش، الطبعة بنك البتراء /عمان1984

Paramedical Program

Specialization	**فحص البصر وتجهيز النظارات الطبية**
Course Number	**21111323**
Course Title	**Contact lenses 2**
Credit Hours	**(3)**
Theoretical Hours	**(3)**
Practical Hours	**(0)**
Teaching language	**English**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- Study the anatomy and physiology of the cornea and lacrimal glands and the best selection of contact lenses and their disadvantages.

Course Objectives:
Upon the completion of the course, the student will be able to:

1. Study of contact lenses and their uses to correct refractive errors and therapeutic uses.
2. The importance of contact lenses cleaning and disinfection.
3. Study of different types of contact lenses, their advantages and disadvantages.
4. Contact lenses insertion and removal.
5. Contact lens effects on the eye.

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Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	**Anatomy and physiology of cornea and lacrimal glands**	▪ Anatomical and physiological description for cornea and lacrimal glands	
2.	**Patient selection**	▪ case history ▪ indication ▪ contraindication	
3.	**Types of contact lenses**	▪ According to wearing time: ▪ extended wear ▪ planned replacement	
4.	**Bifocal contact lenses**	▪ indication ▪ advantages and disadvantages	
5.	**Special types if contact lenses**	▪ cosmetic ▪ therapeutic ▪ prosthetic	
6.	**Advanced and new types of contact lenses**	▪ Some new and advanced types of contact lenses	
7.	**Refraction in contact lenses**	▪ normal (routine) ▪ Binocular disturbances. ▪ high astigmatic myopia	
8.	**Physiological changes according to contact lens wear**	▪ contact lenses effects on accommodation. ▪ optical notes in case of change (wearing contact lenses instead of glasses and vice versa)	
9.	**Contact lenses complication**	▪ during contact lens wear ▪ how to find it ▪ how to manage it ▪ corneal edema ▪ its causes ▪ Symptoms and sign ▪ conjunctival allergy.	

10.	**Study of lens movement and shape changes**	▪ Optics of contact lenses and how they work. ▪ chemical properties of some types of contact lenses	
11.	**Orthokeratology**	▪ indication ▪ Advantages and disadvantages	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	--/--/----
Discussions and lecture Presentations			

Teaching Methodology:

1. Lectures.
2. Discussion & Quizzes.
3. Demonstration & Homeworks

Text Books & References:

1. R.M. Yougson Every thing you need to know about cotact lenses Londan : Sheldon Pres , (last edition)

Paramedical Program

Specialization	**فحص البصر وتجهيز النظارات الطبية**
Course Number	**21111311**
Course Title	**Ocular Pharmacology**
Credit Hours	**(3)**
Theoretical Hours	**(3)**
Practical Hours	**(0)**
Teaching language	**English**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- To present in a concise form the basic consideration of current ocular therapy and pharmacology

Course Objectives:
Upon the completion of the course, the student will be able to:

1. know basics of pharmacology
2. know autonomic nervous system
3. study diagnostic and therapeutic ocular drugs , mode of action indication, contraindication and Complication.
4. study stains used in ophthalmology.

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	**Introduction**	▪ Nature and sources of drugs Basic pharcmcodynamics & pharmacokinetics Routes of administration Dosage	
2.	**Autonomic Nervous System**	▪ Definitins, receptors distribution, neurohormonal transmitters ▪ Sympathetic nervous system, sympathomimetics: adrenaline, noradrenaline,phenylephrine, naphazoline Sympatholytics ▪ Parasympathetic system, parasympathomimetics, ▪ Parasympatholytics: atropine,homatropine,hyosine	
3.	**Diagnostic, Anesthetics Preoperatives drugs**	▪ Diagnostics: atropine, midrapacil ▪ Anesthetics: local & general anesthesia (cocaine, tetracaine, novocin) ▪ Preoperative: methylcellulose..	
4.	**Antiglaucoma Drugs**	▪ Miotics, carbonic unhydrase inhibitors: acetazolamide, dichlorphenamide, brinzolamide,dorsolamide, ▪ Beta blockers: timolol,betaxolol, adrenaline ▪ Osmotic diuretics: mannitol, urea, glycerine Prostaglandin analogues:prostamides ▪ osmotics diuretics : mannitol,urea , glycerine Prostaglandin analogues:	

		prostamides	
5.	**Anti-inflammatory & Immunosupressants Drugs.**	▪ Steriodal: cortisones and its derivatives Non steroidal(NSAIDs): diclofenac sodium Immunosupressants: cyclosporine	
6.	**Antihstamines**	▪ Histamine receptors, histamine release, H1 antagonist, H2 antagonists, Mast cell stabilizers	
7.	**Chemotherapeutics (Antimicrobials)**	▪ Chemotherapy definitions, resistance, eye drops, -Antiviral drugs: interferons, acyclovir, iodoxyuridine. -Antifungal drugs: nystatin, flucytosine,amphotericin,grisofulvin,miconazole, ▪ Clotrimazole, ketoconazole -Antibacterial drugs: Penicillin, ▪ Cephalosporins: ▪ first generation: cephalexin ▪ second generation: cefuroxime, ▪ third generation: cefotaxime ▪ Aminoglycosides, Tetracycline, Chloramphenicol,Fusidic acid, Sulfacetamide, ▪ Quinolones: ciprofloxacin, norfloxacin.ofloxacin ▪	
8.	**Stains used in ophthalmology, Artificial tears.**	▪ Fluorescin , Rose Bengal Lenses solutions,Artificial Tars, others(solcoseryl, butyl cyanocrelat)	
9.	**Laws Of Pharmacology**	▪ Some pharmacology laws in ophthalmic drugs	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	
Discussions and lecture Presentations			

Teaching Methodology:

يحدد عضو التدريس الطريقة المستخدمة من خلال (محاضرة ،عرض ،مناقشات ، تدريب عملي على الأجهزة والفحص لدى أطباء العيون)

Text Books & References:

References:

1. Rang, Dale, Ritter, Moore 2003,Pharmacology,fifth edition, Churchill Livingston
2. Terminology and Guidelines for Glaucoma, second edition,2003,European Glaucoma society ne Editrice DOGMA S.r.l. Italy.
3. Jack j Kansky 2003 Clinical Ophthalmology, fifth edition, Butterworth Heinmann.
4. Bartlett , Jimmy. 2001 Clinical Ocular Pharmacology , Elsevier Health Sciences.

Paramedical Program

Specialization	**فحص البصر وتجهيز النظارات الطبية**
Course Number	**21111341**
Course Title	**Ethics**
Credit Hours	**(2)**
Theoretical Hours	**(2)**
Practical Hours	**(0)**
Teaching language	**Arabic**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

وصف المادة :

- ❖ دراسة وتحليل العمل المهني ومتطلبات المهنة الاساسية وكذلك دراسة اخلاقيات المهنة والمسؤوليات القانونية.

أهداف المادة

يتوقع من الطالب بعد دراسة هذه المادة أن يكون قادرا على تحقيق الأهداف التالية:

1. التعرف على مفهوم المهنة بشكل عام ومتطلباتها الأساسية.
2. ان يكون قادر على تحليل العمل المهني وأن يعرف أهدافه.
3. ان يتعرف على معنى الأخلاق ووصيفتها في الحياة.
4. ان يتعرف على المسؤوليات القانونية والأخلاقية للعمل المهني.
5. ان يتعرف على ادآب مهن طبية مختلفة وقوانين فحص البصر ومجهزي النظارات الطبية والعدسات اللاصقة.

الوصف العام

رقم الوحدة	عنوان الوحدة	محتويات الوحدة	الزمن
.1	المهنة ومتطلباتها		
.2	التوجيه المهني		
.3	الاختيار المهني		
.4	تحليل العمل المهني واهدافه		
.5	الاخلاق واخلاقيات المهنة		
.6	السلوك الإخلاقي والسلوك غير الاخلاقي		
.7	واجبات العامل نحو عمله والموظف نحو وضيفته		
.8	الرقابة في العمل المهني		
.9	مهنة الطب وادابها		
.10	مهنة الصيدلية وادابها		
.11	قوانين مهنة فحص البصر ومجهزي النظارات الطبية والعدسات اللاصقة		

❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008

طرق التقويم المستخدمة :		
الامتحانات	نسبة الامتحان من العلامة الكلية	التاريخ
الامتحان الاول	%20	التاريخ : / /
الامتحان الثاني	%20	التاريخ : / /
أعمال الفصل (حضور ومشاركة ووظائف)	%10	التاريخ : / /
الامتحانات النهائية	%50	التاريخ : / /

طرق التدريس:

- يحدد عضو التدريس الطريقة المستخدمة من خلال (محاضرة ،عرض ،مناقشات)

الكتب والمراجع:

1. رشيد عبد الحميد ومحمود الحيارى،اخلاقيات المهنة،ط2 عمان :مكتبة الشباب ومطبعتها، 1985
2. محمد عبد الغني المصري اخلاقيات المهنة، عمان :مكتبة الرسالة الحديثة،1986

1.

Paramedical Program

Specialization	**فحص البصر وتجهيز النظارات الطبية**
Course Number	**21111225**
Course Title	**Glasses preparation/ practical**
Credit Hours	**(2)**
Theoretical Hours	**(0)**
Practical Hours	**(6)**
Teaching language	**English**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- Recognition of the instruments that are used to measure the optical lenses and to prepare the medical glasses.

Course Objectives:
Upon the completion of the course, the student will be able to:

1. Recognition of the lensmeter and it's practical application in measuring the power of different types of lenses
2. Recognition of the smoothing equipments and on the glasses industrialization stages.
3. To study and employ the basics and the steps of the manual and automatic carving (the Hand and automatic edger)
4. Detailed explanation for special lenses (thick concave lenses) thick convex lenses, and colored land coating lenses.
5. analyzing the medical prescription, complete preparation of glasses and preparing any medical prepared glasses

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	**Lensmeter spherical and displacements center lenses**	▪ Measuring different collections of spherical lenses by the lensmeter and comparing the results with the real values. ▪ Lens collections are not known to the student's so they are trained on - different types of lensmeter ▪ Illustration of the lensmeters	
2.	**Lensmeter (toric)lenses**	▪ Explanation of both types of toric lenses. ▪ Measuring collections of toric lenses and comparing the results with the real values which are previously unknown to the students	
3.	**Lensmeter + neutralization**	▪ measuring the same collection of the toric lenses by the neutralization ▪ measuring the same collection of the toric lenses by the lensmeter ▪ Comparing the results and discussing them.	
4.	**Lensmeter + neutralization (bifocal lenses)**	▪ Measuring collection of the bifocal lenses by the neutralization method then by the lensmeter . ▪ determining the measurement of the segment by the firbank rules and marking pens	

5.	**lens smoothing instrument**	▪ to make students known there instruments and how they work ▪ explaining the difficulties of smoothing in special prescriptions	
6.	**manual carving (hand edger) .**	▪ Carving of a collection of spherical; cylindrical land bifocal lenses by the hand edger then fixing them in the suitable farms according to the British specifications	
7.	**automatic carving (automatic edger)**	▪ Carving collection of lenses automatically then fixing them in the suitable frames according to the British specifications.	
8.	**Face measurement**	▪ the required Face measurement's for metal and plastic frames ▪ the Importance of these measurements ▪ training on taking these measurements	
9.	**marking the lenses and glasses preparations**	▪ measuring the collection of single focal and bifocal lenses ▪ Appointment the optical centers and the segment details then marking it by the marking pens.	
10.	**lensemeter (multifocal lenses)**	▪ Measurement of the multifocal lenses by the lensmeter and special rulers for these lenses and marking these lenses	
11.	**Identical copying and the verification of accuracy of the preparation**	▪ Examination of group of lenses by the Lensmeter and other instruments necessary for copying a prescription identical to ready glasses.	

		▪ Comparing the glasses after their preparation with the medical prescription and defining the accepted mistakes and the refused mistakes	
12.	**thick convex lenses**	▪ A strong hypermetropia: causes and problems resulting from it. ▪ Correcting the hyremetropia with glasses and the accompanying difficulties. ▪ The different designs of the lenses used in the treatment of the hypermetropia and detailed explanation to advantages and disadvantages of each design. ▪ The difficulties that the patient suffer from at the use of the thick convex lenses. ▪ Difficulties that face the optician and the necessary consideration when fixing the lenses in the frames and choosing the frame. ▪ The study of the difference between the glass and plastic	
13.	**thick concave lenses**	▪ Strong myopia : its causes and problems resulting from it ▪ Correcting the myopia by the glasses and eh accompanying difficulties. ▪ The different designs of the lenses used in the treatment of the myopia and detailed explanation to advantages and disadvantages of each design ▪ Types of glasses and plastic which are used in the lenses and comparing	

		the different types ▪ The difficulties that the patient suffer from it ▪ The difficulties of lenses fixing in the frames and choosing the frames.	
14.	**the colored and special lenses**	▪ the British specifications ;2092 ▪ the recognition of every color that used in the lenses and the effect each one of them has on the light permeability and distinguishing the colures ▪ the method of coloring used ▪ method of coating the lenses with ant scratch layer ▪ Coating he lenses with antireflections layer.	
15.	**analyses of the medical prescription and choosing the suitable medical glasses.**	▪ determining the shape and types of the lens and the measurements necessary for assembling the lenses in the frame that the patient chooses ▪ The measurements: pupilary distance and relation center of the frame and the segment details and the details related to the progressive lenses ▪ The discussion of the available kinds of he lenses suitable to the prescription	
16.	**the integrated preparation**	▪ Receipt of the prescription form the patient and analyzing it -The choice of the frame suitable to the face and the frame -The discussion of different available solutions and the additions with the patient. -Putting the final price	

		▪ The delivery of the glasses to the patient after their carving and the assurance of it -The suitability of the frame to the face in its final situation and holding the necessary modifications so that it keeps the glasses suitable on the nose and the two ears . -The explanation of the glasses use and the care for it and the expected initial difficulties	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	--/--/----
Discussions and lecture Presentations			

Teaching Methodology:

1. Lectures.
2. Discussion & Quizzes.
3. Homeworks

Ext Books & References:

1. L.S.saseini Practice of Optica Dispensibg and Fitting Butterworths Group Butterworths 1975 Comp. Chilton Hazel
2. watson &Winy ltd 1977

Butterworths1982

Butterworths1977

Butterworths1984

Clayton Spectale frame Dispensing
Bnnett Ophthalnic prescribtion work.
Kozol ophthalnic fitty and Adiusting
British Stavd Standard lnstitute Glossary of Terns relating Ophthalmic lenses and spectacle frames
M. Jalie The Principlec of Ophthalmic Lenses

W. H. A. Fincham Optics
M. H. Freeman

H. obstfeld Optics in Vision
H. H. Emsley Visual Optics(1,2)

A.G. Bennett clinical visual Optics.
R,B. Rabbetts

Paramedical Program

Specialization	**فحص البصر وتجهيز النظارات الطبية**
Course Number	**21111233**
Course Title	**Ophthalmic lenses test/ practical**
Credit Hours	**(2)**
Theoretical Hours	**(0)**
Practical Hours	**(6)**
Teaching language	**English**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- practical Recognition of the optical lenses in all types and materials , studying their features and measurement of the power of the lenses by different methods and choosing the suitable lens for the prescription and patient's need.

Course Objectives:
Upon the completion of the course, the student will be able to:

1. To study the optical lenses, their types and the different materials they are made of.
2. To study the characteristics of every types of lenses (the positive and negative aspects).
3. To enable the student to write the lense's power precisely and determine the type of lenses surface and it's power.
4. To recognize the importance of the lense's position in the frame according to the medical prescription errors, and the results of these errors.

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	**the history of lenses, material and equipment used in their manufacture.**	▪ Historical glance of the refractive surfaces and using them in correcting vision. ▪ Development of the optical lenses. ▪ The materials which used in manufacturing the lenses, as the glass and plastic, and their positive and negative characteristics. ▪ Scientific development to avoid the negative features of different types of lenses like strengthening the glass and coating the plastic with steroid layers. ▪ Different coating layers available. ▪ Methods of manufacturing the optical lenses (glass and plastic). ▪ The refractive index and it's variation according to material ▪ The high index lenses: the plus and the minus lenses, the thickness, the dispersing index and the density	
2.	**Classification of spherical lenses**	▪ Defining the spherical lenses as equal powers in all directions. ▪ Nature of motions in spherical lenses ▪ The recasting ships between the direction of motions and power	
3.	**Neutralization of spherical lenses by the hand**	▪ recognition of the trial set lenses and relate the known power with visible motion. ▪ notarization of lenses of unknown powers lenses by the trial lenses and studying the effect of the lens center	

		on the motion in lenses ▪ the different designs of spherical lenses and recognize of design type by the ruler ▪	
4.	**classification of cylindrical lenses**	▪ the motion in the cylindrical lenses (scissors motion) ▪ the distinction between the spherical and cylindrical lenses ▪ Recognition of the different power at different axises through the reflection of the surface.	
5.	**using lensmeter**	▪ The required equipments:- lensmeter and lenses with different powers ▪ Introduction to the principle and the foundations of the lensmeter. ▪ Using the lensmeter for knowledge of the curve in optical different surfaces.	
6.	**neutralizing the toric lenses by hand**	▪ the required equipment : - toric lenses, trial lenses, lensmeter, pens and rulers ▪ Using the lensmeter to know the base curve and corss curve and the dimensions of the different lenses. ▪ To exercise the writing and determining the prescription practically, and neutralizing the toric lenses by hand. ▪ Triting the prescriptions by method, and then transferring it to another method.	

7.	**the prism and tangent measure**	▪ Required equipments:- Tangent measure and prisms with different powers . ▪ Identification of the prisms anon-bowed surface ▪ The influence of the prisms on the light waves ▪ The way of prism measurement ▪ Designing the Tangent measure ▪ The relation between the tangent measure and Iorthwes measure ▪ The measurement of thickness of the prism's edge ▪ Marking the prism by the stable hint line (Base up , Base out ……) ▪ Placing the prism in many axises and place many prismatic powers in single lens .	
8.	**The optical lenses**	▪ Required equipments: - cut and uncut optical lenses, prescriptions for the cut lenses, pens, rulers and tangent measure. ▪ Conclusion the equation by experiments ▪ Marking the optical centers of lenses which there is no prismatic effect in the center ▪ The prismatic effect in the distance parts from the center. ▪ Invented prism (influence of the prism) by the displacement. ▪ Marking the lenses with the invented prism ▪ The prisms in the prescription (British Prisms)	

9.	**The electrical lensmeter**	▪ Introduction about the lensmeter and it's uses like measuring the lens power, prism power and determining the axis. ▪ The Types: - Dynamic. - Static. ▪ training the students on using the lensmeter ▪ putting the power knob on the zero power ▪ reading the power of lenses ▪ marking the un cut lenses ▪ marking and determining the Direction of the Base of prism in the lenses ▪ writing the medical glasses prescription ▪ coinciding the reading of glasses with the glasses prescription	
10.	**Bifocal and Trifocal lenses**	▪ The importance of correcting the near and distance vision at the same time. ▪ The types and the shapes of bifocal and multi focal lenses. ▪ The ways of their manufacture and their advantages and disadvantages. ▪ The importance of diameter the image in these lenses (diameter of lens and the segment in the lens) ▪ The states that cause vertical prismatic effect (anisometropia) and measuring the vertical influence. ▪ Different methods to over come the vertical prismatic influence	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	--/--/----
Discussions and lecture Presentations			

Teaching Methodology

1. Lectures.
2. Demonstration.
3. Discussion and quizzes.

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Paramedical Program

Specialization	**فحص البصر وتجهيز النظارات الطبية**
Course Number	**21111122**
Course Title	**Principles of ophthalmic lenses**
Credit Hours	**(3)**
Theoretical Hours	**(3)**
Practical Hours	**(0)**
Teaching language	**English**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- Recognition of the optical lenses in all types and materials , studying their features and measurement of the power of the lenses by different methods and choosing the suitable lens for the prescription and patient's need.

Course Objectives:
Upon the completion of the course, the student will be able to:

1- To study the optical lenses, their types and the different materials they are made of.
2- To study the characteristics of every types of lenses (the positive and negative aspects).
3- To enable the student to write the lense's power precisely and determine the type of lenses surface and it's power.
4- Prisms
5- Lights and snelln law

Detailed Course Description:

Unit Number	Name Unit	Content Unit	Time Needed
1	**the history of lenses, material and equipment used in their manufacture.**	A– Historical glance of the refractive surfaces and using them in correcting vision. B – Development of the optical lenses. C– The materials which used in manufacturing the lenses, as the glass and plastic, and their positive and negative characteristics. D– Scientific development to avoid the negative features of different types of lenses like strengthening the glass and coating the plastic with steroid layers. G– The refractive index and it's variation according to material H– The high index lenses: the plus and the minus lenses, the thickness, the dispersing index and the density	
2	**Classification of spherical lenses**	• Defining the spherical lenses as equal powers in all directions. • Nature of motions in spherical lenses • The recasting ships between the direction of motions and power	
3	**Neutralization of spherical lenses by the hand.**	1* recognition of the trial set lenses and relate the known power with visible motion. 2* notarization of lenses of unknown powers lenses by the trial lenses and studying the effect of the lens center on the motion in lenses 3* the different designs of spherical lenses and recognize of design type by the ruler.	
4	**classification of cylindrical lenses**	▪ the motion in the cylindrical lenses (scissors motion) ▪ the distinction between the spherical and cylindrical lenses ▪ Recognition of the different power at different axises through the reflection of the surface.	

5	**Determine which side contains the cylindrical surface by the reflection,**	▪ Know the distinction between the convex and concave lenses. ▪ Determine the axis of the lenses. a. The neutralization by the trial spherical lenses only. b. The neutralization by the trial (sphero-cylindrical) lenses. c. Marking the axis of the lens d. Transposition the sphero-cylinder lenses	
6	**using lensmeter**	The required equipments:- lensmeter and lenses with different powers - Introduction to the principle and the foundations of the lensmeter. - Using the lensmeter for knowledge of the curve in optical different surfaces.	
7	**The toric lenses and the transposition**	- The definition of the toric lenses and their principle - The base curve and cross curve. - The recognition of the different ways for writing the toric lenses prescription - using the lensmeter	
8	**neutralizing the toric lenses by hand**	▪ the required equipment : - toric lenses, trial lenses, lensmeter, pens and rulers ▪ Using the lensmeter to know the base curve and corss curve and the dimensions of the different lenses. ▪ To exercise the writing and determining the prescription practically, and neutralizing the toric lenses by hand. ▪ Writing the prescriptions by method, and then transferring it to another method.	
9	**the prism**	▪ Identification of the prisms anon- bowed surface ▪ The influence of the prisms on the light waves ▪ The way of prism measurement	

10	**Bifocal and Trifocal lenses**	▪ The importance of correcting the near and distance vision at the same time. ▪ The types and the shapes of bifocal and multi focal lenses. ▪ The ways of their manufacture and their advantages and disadvantages. ▪ The importance of diameter the image in these lenses (diameter of lens and the segment in the lens) ▪ The states that cause vertical prismatic effect (anisometropia) and measuring the vertical influence. ▪ Different methods to over come the vertical prismatic influence	
11	**Knowing of types of rays at atmosphere and usages a protection lenses such as tinted lens and filters**		
12	**The way of hardening of the glass lenses**		
13	**The converting the sphere-cylinder lenses to toric lenses and visa versa**		
14	**Thin and thick lenses and it is equal vent power**		
15	**To enable the student to write the lenses power precisely and determine**		
16	**types of aberrations and can we overcome them**		

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	%20	----/--/--
	Second Exam	%20	----/--/--
	Final Exam	%50	----/--/--
Homework and Projects		%10	----/--/--
Discussions and lecture Presentations			

Teaching Methodology:

- Lectures
- Slides and posters
- Pratice inside labs

Text Books & References:

Reference

D. Aumer Alshek (مقدمة للبصريات الكلاسيكية والحديثة)
مؤسسة الشومان – مجمع اللغة العربية الأردني 1983

Paramedical Program

Specialization	**فحص البصر وتجهيز النظارات الطبية**
Course Number	**21111222**
Course Title	**Physical optics 1**
Credit Hours	**(3)**
Theoretical Hours	**(3)**
Practical Hours	**(0)**
Teaching language	**English**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- Study the physical properties of light and the study of diffraction, interference, and polarization.

Course Objectives:

Upon the completion of the course, the student will be able to:

1. to understand the basic properties for the light spread.
2. the practical applications and the optical instruments.

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	**light**	▪ Introduction ▪ Light theories ▪ Speed of light and methods of measuring the speed of light ▪ Energy, kinds, frequency and wavelength.	
2.	**color**	▪ Introduction ▪ Color mixing ▪ Color calculating ▪ Reforming color ▪ colorimeter	
3.	**photometry**	• introduction • units of color measuring • lighting definition • light intensity • calculate the light intensity of point source • contrast	
4.	**Dispersion of light**	• introduction • spectrum • observation • light of unit color and its feature	
5.	**Systems of the lenses in the instruments**	• introduction • theories and laws • electromagnetic spectrum • energy calculating • relevant evidences of the electromagnetic theory	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	--/--/----
Discussions and lecture Presentations			

Teaching Methodology:

1. lectures
2. discussion and quizzes
3. demonstration and homeworks

Text Books & References:

References :

1. duane's clinical ophthalmology. William tasman, Edward ajaeger. Lippincott- raven publisher. Revised edition 1996.
2. fundamentals of optics, D.R. Khanna, (kelhi: chand Co. 1989)
3. A.R. elkington and J. frank, clinical optics, Blackwell scientific publication 1992.

Paramedical Program

Specialization	**فحص البصر وتجهيز النظارات الطبية**
Course Number	**21111322**
Course Title	**Physical optics 2**
Credit Hours	**(3)**
Theoretical Hours	**(3)**
Practical Hours	**(0)**
Teaching language	**English**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- Study the physical properties of light and the study of diffraction, interference, and polarization.

Course Objectives:

Upon the completion of the course, the student will be able to:

1. to understand the basic properties for the light spread.
2. the practical applications and the optical instruments.

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	**Electromagnetics**	▪ Introduction ▪ Theories and laws ▪ Electromagnetic spectrum ▪ Energy calculating ▪ Relevant evidences of electromagnetic theory	
2.	**interference**	▪ Introduction ▪ Principal ▪ Harmonic movements of the waves ▪ Conditions for interference ▪ Kinds of interference ▪ Importance and applications of the interference	
3.	**diffraction**	• introduction • principles and conditions • how does the diffraction happen • applications of the diffraction • disadvantage of the diffraction	
4.	**polarization**	• introduction • principle of the polarization • kinds of the polarization material • applications of the polarization	
5.	**laser**	• atomic emission spectrum (energy levels, emission and absorption, stimulated emission) • laser build • types of laser	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	--/--/----
Discussions and lecture Presentations			

Teaching Methodology:

1. lectures
2. discussion and quizzes
3. demonstration and homeworks

Text Books & References:

References :

1. duane's clinical ophthalmology. William tasman, Edward ajaeger. Lippincott- raven publisher. Revised edition 1996.
4. fundamentals of optics, D.R. Khanna, (kelhi: chand Co. 1989)
5. A.R. elkington and J. frank, clinical optics, Blackwell scientific publication 1992.

Paramedical Program

Specialization	**فحص البصر وتجهيز النظارات الطبية**
Course Number	**21111200**
Course Title	**Field training 1**
Credit Hours	**(3)**
Theoretical Hours	**(0)**
Practical Hours	**280 training hours**
Teaching language	**English**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- Training the students to measure the visual acuity and examine the eye pathological and refractivly.

Course Objectives:
Upon the completion of the course, the student will be able to:

1. benefiting from is the ophthalmologist and how they deal with patients listening to their complaints and their medical history .
2. knowing the difficulties of dealing with patients
3. recognition of medical instruments which are a available in the ophthalmology clinic
4. evaluation status of the patient generally and examination them refractivly
5. Be familiar of different eye disease
6. Using the eye examination instruments

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	**Observing the procedures that are used in ophthalmology clinic**	▪ The student's recognition of the Importance of diseases files ▪ Listening to carefully the ophthalmologist and observing the way he deals with the patients ▪ Noticing the way of writing the diseased files	
2.	**measuring the visual acuity**	▪ Practical training on measuring the visual acuity ▪ Knowing a different types of vision charts which are used in measuring the visual acuity ▪ Measuring the visual acuity in children	
3.	**the recognition of the medical instruments**	▪ the recognition of the ophthalmoscope (the fondues examination instruments) ▪ The recognition of the slit lamp and how to use it. ▪ observing the usage of the Retinoscope by an of ophthalmologist ▪ learning how to write spectacles prescription carefully	
4.	**using the Retinas scope**	▪ examination the patents between (16-40) years ▪ discussing the difficulties of the Retinoscope scope with the doctor or the examiner ▪ knowledge of the types of Rationscope	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	--/--/----
Discussions and lecture Presentations			

Teaching Methodology:

1. Lectures.
2. Demonstrations & Homeworks.
3. Discussion & Quizzes.

Text Books & References:

Paramedical Program

Specialization	**فحص البصر وتجهيز النظارات الطبية**
Course Number	**21111300**
Course Title	**Field training 2**
Credit Hours	**(3)**
Theoretical Hours	**(0)**
Practical Hours	**280 training hours**
Teaching language	**English**

❖ **تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008**

Brief Course Description:

- Entitling the students to professing the eye examination and spectacles preparation career precisely to choosing the suitable Frames and lenses and to deal with patients .

Course Objectives:

Upon the completion of the course, the student will be able to:

1. to learning the students how to deal the dealing with patients
2. Making sure of doing he students of all the eye examination procedures
3. Making sure of choosing the students the suitable Frames and lenses
4. Educational methods
5. Training in the optics centers

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
.1	**subjective test**	▪ measure the visual acuity by Retinosope description measurements ▪ the requests procedures to reaches the best visual aeuty ▪ duochrome (red-green test) ▪ clock chart (sunburst diall)	
.2	**Medical spectacles prescription**	▪ writing suitable medical spectacles prescription ▪ discussing the difficulties which the patient can meet it in this prescription ▪ measuring the interpupillary distance (PD) and the Back verfex distance.	
.3	**refractive examination of the eye**	▪ examination the patients refractivly the patient to ophthalmologist in important vision cases or diseased cases ▪ Writing the prescription correctly	
.4	**choosing the medical spectacles & medical glasses preparation**	▪ discussing the possible types of lenses and the requisite coation layers for the patient ▪ choosing a suitable frame for the patient and face and the prescription ▪ training on taking all requisite measurements to prepare the	

		glasses ▪ practical training of preparing the glasses in all the steps . ▪ Examination the glasses carefully after preparing them . ▪ The final adjusting of the frame to suit the patient's face	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	--/--/----
Discussions and lecture Presentations			

Teaching Methodology:

1. Lectures.
2. Discussion, Ceminars & Quizzes.
3. Homeworks and demonstration