COURSE SPECIFICATION

(Optics of the Eye)

Faculty of Medicine– Mansoura University

(A) Administrative information

(1) Programme offering the course:	MD degree of Ophthalmology programme
(2) Department offering the programme:	Ophthalmology department
(3) Department responsible for teaching the course:	OPhthalmology department
(4) Part of the programme:	MD degree of Ophthalmology programme 1st part
(5) Date of approval by the Department`s council	31/7/2016
(6) Date of last approval of programme specification by Faculty council	9-8-2016
(7) Course title:	**Optics OPHT 622 OP**
(8) Course code:	**622 OP**
(9) Credit hours	**1**
(10) Total teaching hours:	30 hours

(B) Professional information

(1) Course Aims:

The broad aim of the course is to educate students about Optics of the Eye also to provide the students with updated data and researches concerned the eye, including the application of physical, geometric and physiological optics to clinical management and an appreciation of the principles of instrumentation and clinical practice in these areas.

(2) Intended Learning Outcomes (ILOs):

On successful completion of the course, the candidate will be able to:

A- Knowledge and Understanding

A1	Understand the light and its refraction
A2	Understand the optical principles of different types of lenses and prisms and their identification and uses in fitting glasses.
A3	Understand the optical principles of different types of ophthalmic instruments.
A4	Understand the optical principles of different types of -contact lenses and principles of fitting, intraocular lenses and low vision aids.
A5	Understand the theory and terminology of physical optics.
A6	Recognize the clinical and technical relevance of such optical phenomena as interference, coherence, polarization, diffraction, and scattering.
A7	Understand the basic properties of laser light.
A8	Outline the principles of light propagation and image formation and some properties as refraction, reflection, magnification, and vergence.
A9	Label optical models of the human eye and how to apply them.
A10	Understand the various types of visual perception and function, including visual acuity, brightness sensitivity, color perception, and contrast sensitivity.
A11	List the indications for prescribing bifocals and common difficulties encountered in their use.
A12	Understand the optical principles underlying various modalities in refractive correction: spectacles, contact lenses, intraocular lenses, and refractive surgery.
A13	Understand the basic methods of calculating intraocular powers and the advantages and disadvantages of the different methods.

B- Intellectual skills

I 1	Identify the errors of refraction and their correction
I2	Verify the corrective lenses suitable for every patien
I3	Identify proper use of ophthalmic instrument.
I4	State the steps for performing streak Retinoscopy.
I5	Summarize the steps for performing a manifest refraction using a phoropter or trial lenses.
I6	Describe the use of the Jackson cross cylinder.
I7	Describe the indications for prescribing bifocals and common difficulties encountered in their use.
I8	Review the materials and fitting parameters of both soft and rigid contact lenses.
I9	Explain the optical principles underlying various modalities in refractive correction: spectacles, contact lenses, intraocular lenses, and refractive surgery.
I10	Discuss the basic methods of calculating intraocular powers and the advantages and disadvantages of the different methods.
I11	Describe the conceptual basis of multifocal IOLs and how the correction of presbyopia differs between these IOLs and spectacles.

(3) Course content:

Subjects	Lectures	Clinical	Laboratory	Field	Total Teaching Hours
1. **Physical**	**6**				**30**
○ Nature of light, properties of light					
2. **Geometric**					
○ Reflection: plane, spherical mirrors					
○ Refraction: Plane, convex lens, concave lens, prisms, cylindrical lenses					
○ Toric refraction by the eye					

(Schematic, reduced eye)					
3. **Clinical**	**9**				
○ Aberrations					
○ Ametropias: Hyperopia, Myopia, Astigmatism, Aphakia, Anisometropia,aniseikonia					
○ Accommodation (prespyopia): Excess, spasm, insufficiency, paralysis					
○ Binocular Muscle Coordination: convergence					
○ Binoular Muscle Anomlies: Heterophoria , Heterotropia					
○ Convergence: excess, insufficiency					
○ Visual acuity: far , Near, measurement					
○ Retinoscopy:					
○ Ophthalmoscopy: Direct, indirect					
○ Verification of refraction	**6**				
4. **Appliances:**					
○ Spectacles, Contact lenses, Intra ocular lenses, Low vision aids					
5. **Instruments:**	**6**				
○ Microscopy , operating microscope , Slit Lamp , Fundus Camera Refractometers , Keratometers , Orthoptic					
○ LASER	**3**				

(4) Teaching methods:

4.1: Lecture

4.2: Practical class

4.3: Small group discussion with case study and problem solving

4.4: Tutorial

4.5: Seminars

4.6: Workshops

(4) Assessment methods:

5.1:Written Examination for assessment of ILOs knowledge & intellectual skill.

5.2 MCQ exam for assessment of intellectual and knowledge ILOs

5.3: Log book for activities for assessment of : mainly for assessment practical & transferrable skills
attendance of different conferences, thesis discussions, seminars, workshops
Attendance of scientific lectures.

5.4: seminars: the candidate should prepare and present at least one seminar in atopic related to the course and determined by the supervisors in front of the department staff .

Assessment schedule:

Assessment 1: after 6 month from MD registration (100 marks)

Assessment 2 : Log book required activities to go through 1st part examination .

Assessment 3 : MCQ exam for continuous assessment of knowledge and intellectual skills.

***Assessment 4*:** the candidate should prepare and present at least one seminar in atopic related to the course and determined by the supervisors in front of the department staff (without marks).

Percentage of each Assessment to the total mark:

Written exam: **100 Marks including 20%MCQ**

Other assessment without marks: practical tests and exam, seminars and log book assessment are requirement of the 2nd part exam.

(5) References of the course:

6.1: Text books:

- Optics of the eye: by Elkington,

6.2: Websites:

- rcoph.org.uk

6.3: Recommended books

- Optics of the eye: by Elkington,

(6) Facilities and resources mandatory for course completion:

- Lecture rooms: available in the department

Course content and ILOs Matrix

Programme ILOs are enlisted in the first row of the table (by their code number: a1, a2……etc), then the course titles or codes are enlisted in first column, and an "x" mark is inserted where the respective course contributes to the achievement of the programme ILOs in question.

Subjects	A1	A2	A3	A4	A5	A6	A7	A8	A9
Physical									
○ Nature of light, properties of light	√				√	√	√	√	
Geometric								√	
○ Reflection: plane, spherical mirrors	√				√	√		√	
○ Refraction: Plane, convex lens, concave lens, prisms, cylindrical lenses	√				√	√		√	

○ Toric refraction by the eye (Schematic, reduced eye)	√				√	√		√	
Clinical									
○ Aberrations		√						√	
○ Ametropias: Hyperopia, Myopia, Astigmatism, Aphakia, Anisometropia,aniseikonia		√							√
○ Accommodation (prespyopia): Excess, spasm, insufficiency, paralysis		√							√
○ Binocular Muscle Coordination: convergence		√							√
○ Binoular Muscle Anomlies: Heterophoria , Heterotropia		√							√
○ Convergence: excess, insufficiency		√							√
○ Visual acuity: far , Near, measurement		√							
○ Retinoscopy:		√							
○ Ophthalmoscopy: Direct, indirect		√							
○ Verification of refraction		√							
Appliances:			√						
○ Spectacles, Contact lenses, Intra ocular lenses, Low vision aids			√	√					
Instruments:									
○ Microscopy , operating			√						

microscope , Slit Lamp , Fundus Camera Refractometers , Keratometers , Orthoptic									
○ LASER			√				√		

Subjects	A10	A11	A12	A13
Physical				
○ Nature of light, properties of light				
Geometric				
○ Reflection: plane, spherical mirrors				
○ Refraction: Plane, convex lens, concave lens, prisms, cylindrical lenses				
○ Toric refraction by the eye (Schematic, reduced eye)				
Clinical				
○ Aberrations				
○ Ametropias: Hyperopia, Myopia, Astigmatism, Aphakia, Anisometropia,aniseikonia				
○ Accommodation (prespyopia): Excess, spasm, insufficiency, paralysis				
○ Binocular Muscle Coordination:				

convergence				
○ Binoular Muscle Anomlies: Heterophoria , Heterotropia				
○ Convergence: excess, insufficiency				
○ Visual acuity: far , Near, measurement	√			
○ Retinoscopy:				
○ Ophthalmoscopy: Direct, indirect				
○ Verification of refraction				
Appliances:				
○ Spectacles, Contact lenses, Intra ocular lenses, Low vision aids		√	√	√
Instruments:				
○ Microscopy , operating microscope , Slit Lamp , Fundus Camera Refractometers , Keratometers , Orthoptic				
○ LASER				

Subjects	I1	I2	I3	I4	I5	I6	I7	I8	I9	I10	I11
Physical											
○ Nature of light, properties of light											
Geometric											
○ Reflection: plane, spherical mirrors											
○ Refraction: Plane, convex lens, concave lens, prisms, cylindrical lenses	√										
○ Toric refraction by the eye (Schematic, reduced eye)	√										
Clinical	√										
○ Aberrations	√										
○ Ametropias: Hyperopia, Myopia, Astigmatism, Aphakia, Anisometropia,aniseikonia	√										
○ Accommodation (prespyopia): Excess, spasm, insufficiency, paralysis											
○ Binocular Muscle Coordination: convergence											
○ Binoular Muscle Anomlies: Heterophoria , Heterotropia			√			√					
○ Convergence: excess, insufficiency			√			√					

○ Visual acuity: far , Near, measurement	√	√	√	√	√	√					
○ Retinoscopy:	√	√	√	√	√	√	√				
○ Ophthalmoscopy: Direct, indirect	√										
○ Verification of refraction	√			√	√		√				
Appliances:											
○ Spectacles, Contact lenses, Intra ocular lenses, Low vision aids	√	√						√	√	√	√
Instruments:											
○ Microscopy , operating microscope , Slit Lamp , Fundus Camera Refractometers , Keratometers , Orthoptic			√								
○ LASER			√								

Course methods of assessment and ILOs Matrix

Programme ILOs are enlisted in the first row of the table (by their code number: a1, a2……etc), then the Course methods of assessment are enlisted in first column, and an "x" mark is inserted where the respective course contributes to the achievement of the programme ILOs in question.

Subjects	A1	A2	A3	A4	A5	A6	A7	A8	A9
5.1:Written Examination	✓	✓	✓	✓	✓	✓	✓	✓	✓
5.2 MCQ exam for	✓	✓	✓	✓	✓	✓	✓	✓	✓
5.3: Log book for activities for assessment of : mainly for assessment practical & transferrable skills **attendance of different conferences, thesis**									

discussions, seminars, workshops Attendance of scientific lectures.									
5.4: seminars: the candidate should prepare and present at least one seminar in atopic related to the course and determined by the supervisors in front of the department staff .		✓	✓	✓	✓	✓	✓	✓	✓

Subjects	A10	A11	A12	A13
5.1:Written Examination	✓	✓	✓	✓
5.2 MCQ exam for	✓	✓	✓	✓
5.3: Log book for activities for assessment of : mainly for assessment practical & transferrable skills **attendance of different conferences, thesis discussions, seminars, workshops Attendance of scientific lectures.**				
5.4: seminars: the candidate should prepare and present at least one seminar in atopic related to the course and determined by the supervisors in front of the department staff .		✓	✓	✓

Subjects	I1	I2	I3	I4	I5	I6	I7	I8	I9	I10	I11
5.1:Written Examination	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5.2 MCQ exam for	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

5.3: Log book for activities for assessment of : mainly for assessment practical & transferrable skills **attendance of different conferences, thesis discussions, seminars, workshops** **Attendance of scientific lectures.**											
5.4: seminars: the candidate should prepare and present at least one seminar in atopic related to the course and determined by the supervisors in front of the department staff .	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Subjects	T1	T2	T3	T4	T5	T6	T7	T8	T9
5.1:Written Examination									
5.2 MCQ exam for									
5.3: Log book for activities for assessment of : mainly for assessment practical & transferrable skills **attendance of different conferences, thesis discussions, seminars, workshops** **Attendance of scientific lectures.**									
5.4: seminars: the candidate should prepare and present at least one seminar in atopic related to the course and determined by the supervisors in front of the	✓	✓	✓	✓	✓	✓	✓	✓	✓

department staff .									
5.4: seminars: the candidate should prepare and present at least one seminar in atopic related to the course and determined by the supervisors in front of the department staff .	✓	✓	✓	✓	✓	✓	✓		

Course coordinator: : Prof.Dr Adel El layeh

Head of the department: Prof. Dr Adel El layeh