



# Course Specification

## (Bachelor)

**Course Title:** Applied physical optics

**Course Code:** APOP1105

**Program:** Optician Diploma

**Department:**

**College:** Applied Collage

**Institution:** Umm Al-Qura University, Makkah, Saudi Arabia

**Version:** Course Specification Version Number

**Last Revision Date:** Pick Revision Date.

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## A. General information about the course:

### 1. Course Identification

<b>1. Credit hours: ( 2h )</b>					
2 h					
<b>2. Course type</b>					
A.	<input type="checkbox"/> University	<input type="checkbox"/> College	<input checked="" type="checkbox"/> Department	<input type="checkbox"/> Track	<input type="checkbox"/> Others
B.	<input checked="" type="checkbox"/> Required			<input type="checkbox"/> Elective	
<b>3. Level/year at which this course is offered: ( ..... )</b>					
<b>4. Course General Description:</b>					
<p>Applied Physical optics encompasses the study of light theories. It is essential to define both the visible and invisible spectra. Furthermore, it is important to distinguish between light intensity and luminosity. Aberration should be explained along with its primary causes. Additionally, the concepts of diffraction, interference, and polarization of light must be illustrated. The impact of stops, pupils, and windows on light control should also be elucidated. Moreover, an explanation of light scattering, wavefront types, and various laser types is necessary. Lastly, the application of lasers in ophthalmology should be discussed.</p>					
<b>5. Pre-requirements for this course (if any):</b>					
NA					
<b>6. Co-requisites for this course (if any):</b>					
NA					
<b>7. Course Main Objective(s):</b>					
<ol style="list-style-type: none"> <li>1- Understanding the light theories and Principles</li> <li>2- Understanding the light behaviour and characteristics</li> <li>3- the main causes of aberration and it's control in Lens</li> <li>4- Vision Optics Basics, errors, and correction</li> <li>5- Optical Calculations</li> <li>6- light scattering, wavefront types and types of laser</li> <li>7- Application of laser in ophthalmology</li> </ol>					

### 2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	3	100
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> <li>Traditional classroom</li> </ul>		



No	Mode of Instruction	Contact Hours	Percentage
	• E-learning		
4	Distance learning		

### 3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	3
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify)	
Total		3

## B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Understan the action of visually enlarging an object with the help of lenses	K1	Lectures and Interactive Discussions	Written Exams (Mid-Term and Final Exams), Quizzes.
1.2	Recognize and describe the defects in the eye happen due to growing age, vision decreasing, and when the focal length alters. Also the ways of correcting errors of vision.	K3	Lectures and Interactive Discussions	Written Exams (Mid-Term and Final Exams), Quizzes.
1.3	Describe the method of overcoming the defect of focus , such as blurring in an image, and imperfect image caused by physical defect in an optical element, as in a lens.	K2	Lectures and Interactive Discussions	Written Exams (Mid-Term and Final Exams), Quizzes.
2.0	Skills			
2.1	Measuring the correcting errors of vision.	S1	Interactive Discussions	Written Exams (Mid-Term and Final Exams), Quizzes
2.2	Perform calculations for lens power, thickness, decentration, and prismatic effects.	S3	Interactive Discussions	Written Exams (Mid-Term and Final Exams), Quizzes



Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
3.2	Measure the defect of focus by using appropriate ophthalmic devices.	<b>S1</b>	Interactive Discussions	Written Exams (Mid-Term and Final Exams),
<b>3.0</b>	<b>Values, autonomy, and responsibility</b>			
3.1	Work cooperatively in a small group environment	<b>V1</b>	Individual and Group Presentations	Presentations

## C. Course Content

### C.1 Theoretical Content

No	List of Topics	Contact Hours
1.	Introduction to Applied Optical Physics	2
2.	Explain the light theories	2
3.	Define the visible and invisible spectrum	2
4.	Differentiate between light intensity and luminosity	2
5.	Illustrate diffraction, interference, and polarization of light	2
6.	Illustrate diffraction, interference, and polarization of light	2
7.	Explain aberration and the main causes of aberration	2
8.	Aberration Control in Lenses	2
9.	Identify the optical system of the eye	2
10.	Vision and Optics Basics	2
11.	Explain the effect of stops, pupil, and window in light control	2
12.	Angular and Spectacle Magnification and Relative Spectacle Magnification	2
13.	Refractive errors and vision correction	2
14.	Explain light scattering, wavefront types and types of laser.	2
15.	Application of laser in ophthalmology.	2
<b>Total</b>		<b>30</b>

## D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	<b>Quizzes</b>	<b>5</b>	<b>10</b>





No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
2.	Mid-Term Exam	8	20
3.	Presentations	12	10
4.	Homework	All weeks	10
5.	Final Exam	16	50

\*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

## E. Learning Resources and Facilities

### 1. References and Learning Resources

Essential References	"Principles of Ophthalmic Lenses" by M. Jalie
Supportive References	
Electronic Materials	
Other Learning Materials	

### 2. Required Facilities and equipment

Items	Resources
<b>facilities</b> (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms, , exhibition rooms
<b>Technology equipment</b> (Projector, smart board, software)	Projector
<b>Other equipment</b> (Depending on the nature of the specialty)	

## F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students and Faculty	Direct
Effectiveness of students' assessment	Faculty and Program Leaders	Direct
Quality of learning resources	Students, Faculty and Program Leaders	Indirect
The extent to which CLOs have been achieved	Faculty and Program Leaders	Indirect
<b>Other</b>		

**Assessors** (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify))

**Assessment Methods** (Direct, Indirect)





## G. Specification Approval

COUNCIL /COMMITTEE	Umm Al-Qura University Council
REFERENCE NO.	851141114462/190386
DATE	1446/11/22

