



Faculty: Faculty of Science	
Department: Physics	Program: Bachelor's Program
Semester: Second semester	Academic year: 2023/2024

Course Plan

First: Course Information

Course Name:	Optics		Course No. 0302230		
Credit Hours:	2 hrs	Theoretical	2	Practical	0
Prerequisite:	0300122	Class Number: 1		Lecture Time:	
Level in JNQF	7				
Course Nature:	<input type="checkbox"/> <i>Mandatory Faculty Requirement</i> <input type="checkbox"/> <i>Optional University Requirement</i> <input type="checkbox"/> <i>Mandatory University Requirement</i> <input type="checkbox"/> <i>Ancillary Course</i> <input type="checkbox"/> <i>Optional Specialty Requirement</i> <input checked="" type="checkbox"/> <i>Mandatory Specialization requirement</i>				
Type of Education:	<input checked="" type="checkbox"/> Fully Direct (Fully Face-to-Face Education) <input type="checkbox"/> Integrated Education (2 Face-to-Face + 1 Asynchronous) <input type="checkbox"/> Electronic Education Fully (1 Asynchronous + 2 Synchronous)				

Second: Instructor's Information

Course coordinator		
Instructor		
Name:	Office Number:	Email:
Office Hours:		

Third: Short Description of the Course

This is a course to introduce students to the fundamentals of optics. Both geometric optics and quantum optics are introduced. The concepts and principles of lenses and mirrors and the laws of interference and diffractions are demonstrated.

Fourth: Course objectives

Fifth: Learning Outcomes

<i>Level descriptor according to (JNQF)</i>	<i>CILOs Code</i>	<i>CILOs</i> If any CILO will not be assessed in the course, mark NA.	<i>Associated PILOs Code</i> Choose one PILO for each CILO*	<i>Assessment method**</i> Choose at least two methods	<i>Scores out of 100</i> State the total score identified for each CILO	<i>Minimum acceptable Score/percentage (%)</i> <i>The percentage should not be less than 50%***</i>
Knowledge	K1	Basic knowledge : Use the principles of waves	P. K1	Midterm exam Final exam	34	17 (50%)
	K2	Basic Factual Knowledge: Principles of Huygens and Fermat. Superposition principle and Sneli's law. Frunhofer and Fresnel diffractions	P. K1	Midterm exam Final exam	36	18 (50%)
	K3	Concepts and Theories:	P-K3	Midterm exam Final exam		
Skills	S1	Problem solving skills: Students solve problems. I'm intending to give those assignments and homework and to encourage group projects, but I can say that technology has become an integral part of their lives, and use computer programs to draw and solve mathematical equations, derivation and integration and they feel confident in this area.	P. S1	Midterm exam Quiz	10	5 (53%)
	S2	Modeling and Design: Problem solving (choice of practices based on the situation and the representation or model). -Applying the relevant laws to the				

		problems				
	S3	Applying mathematical and experimental tools in physics				
	S4	Design, create and develop solutions to physics problems - Integrate the concepts and principles of physics and its role in life sciences. - Interpret any phenomena according to physical laws.	P. S1	Quiz Final	10	5 (50%)
Competencies	C1	Analytic skills: Relate the theoretical information to practical work to increase the understandings of the basic knowledge	P. C3	Assignment Final exam	10	5 (50%)
	C2	Strategic thinking: Demonstrate critical thinking/analytical reasoning ability by using the mathematical descriptions of physical systems and to calculate measurable quantities that provide an understanding of the physical environment in terms of the concepts listed in the course content.				

	C3	<p>Creative thinking and innovation:</p> <ul style="list-style-type: none"> -Thinking of more than one answer. - Respond the questions with many alternative questions - Generate ideas, answers, or varied questions - See a problem from different perspective. - Look for many different alternatives or directions. - Able to change the way of approach or thought. - Think of unusual ways to express their selves - Work and develop a product or idea - Add or detail of object, idea or situation so that it becomes more interesting 				
	C4	<p>Perform professional responsibility (Integrity, Confidentiality) and ethical responsibility (Informed Consent) and safety instructions(Laboratory Safety, Equipment Safety, Risk Assessment, Documentation, Clear Reporting, Collaboration, Professional Development, Community Engagement, Outreach)</p>				

*Refer to document (CC-2023-02) and page 2 in document (CC-2023-01)

** Refer to document (CC-2023-05)

****80% of the students** must achieve the minimum acceptable percentage or higher for each CILO

Sixth: Learning Source

Designated Book:	<i>Introduction to Optics</i>		
Author: Pedrotti	Print: 3 th edition	Year: 2010	
Additional Sources: Website:	1. Optics, by E. Hecht, 4th edition (Addison-Wesley). 2. Introduction to Modern Optics, by Fowles (Dover Book). 3. Schaum's outlines - Optics, by E. Hecht (McGraw-Hill).		
Teaching Type:	<input checked="" type="checkbox"/> Classroom <input type="checkbox"/> Laboratory <input type="checkbox"/> Workshop <input type="checkbox"/> MS Teams <input checked="" type="checkbox"/> Moodle		

Seventh: Course Structure

Lecture Date	Topics	Teaching Procedures*	Teaching Methods**	Covered CILOs	References***
15/10/2023	Review of course topics and assessments	Direct teaching	Lecturing Discussion Whiteboard Power point	K1,K2	
17/10/2023	Chapter 1: Nature of light	Direct teaching	Lecturing Discussion Whiteboard Power point	K1,K2,S1,S3,C1;C2;	Pages 1-2
22/10/2023	Brief history	Direct teaching	Short videos Assignment1	K1,K2,S1,S3,S4;S5;C1,C2	Pages 3-4
24/10/2023	Electromagnetic spectrum	Direct teaching	Lecturing Discussion Whiteboard Power point	K1,K2,S1,S3,S4;S5;	62-67
29/10/2023	Radiometry	Direct teaching	Lecturing Discussion Whiteboard Power point	K1,K2,S1,S3,	67-71
31/10/2023	Chapter 2: Geometric optics	Direct teaching	Short videos Quiz1	K1,K2,S1,S3,S4;S5;	62-71
5/11/2023	Huygens' Principle, Fermat's Principle and Principle of	Direct teaching	Lecturing Discussion Whiteboard Power point	K1,K2, S1,S3;C1,C2	75-78

	Reversibility				
7/11/2023	Reflection and Refraction	Direct teaching	Lecturing Discussion Whiteboard Power point	S1,S3;C1,C2	84-86
12/11/2023	Thin Lenses	Direct teaching	Short videos Assignment2	K1,K2,S1,S3,S4;S5;C1,C2	86-90
14/11/2023	Vergence and Refractive Power	Direct teaching	Lecturing Discussion Whiteboard Power point	K1,K2,S1,S3,S4;S5;C1,C2	18-19 34-38
19/11/2023	Image formation Thick lenses and thin lenses Optical instruments	Direct teaching	Lecturing Discussion Whiteboard Power point	K1,K2,S1,S3,S4;S5	
21/11/2023	Prisms	Direct teaching	Short videos Quiz2	K1,K2,S1,S2,S5	198-201
26/11/2023	The Camera, Magnifiers, Microscopes and telescopes	Direct teaching	Lecturing Discussion Whiteboard Power point	K1,K2,S1,S2,S4;S5;C1,C2	202-204
28/11/2023	Tutorial and problem solving	Direct teaching	Lecturing Discussion Whiteboard Power point	K1,K2,S1,S3,S5;C1,	211-218
3/12/2023	Chapter 4: Wave Equations	Direct teaching	Short videos Assignment3		219-222
5/12/2023	One-dimension wave equation	Direct teaching	Lecturing Discussion Whiteboard Mathematica simulation Power point	K1,K2,S1,S3,S4;S5;C1,C2	225-227
10/12/2023	Harmonic waves as complex numbers	Direct teaching	Lecturing Discussion Whiteboard Power point	K1,K2,S1,S3,S3;S5;	303-306
12/12/2023	Plane waves, Spherical waves, Electromagnetic waves, Light polarization	Direct teaching	Short videos Assignment4	K1,K2,S1,S3,S4;S5;C1,C2	315-318
17/12/2023	Tutorial and problem solving	Direct teaching	Lecturing Discussion Whiteboard Power point	K1,K2,S1,S3,S4;S5;	326-330

19/12/2023	Chapter 5: Superposition of waves, Superposition principle	Direct teaching	Lecturing Discussion Whiteboard Power point	K1,K2,S1,S3,S4;	326-330
24/12/2023	Superposition of waves of the same frequency and standing waves	Direct teaching	Short videos Quiz3	K1,K2,S1,S3,S4;S5;C1,C2	332-337
26/12/2023	Interference of light	Direct teaching		K1,K2,S1,S3,S4;S5;C1,C2	
31/12/2023	Two-beam interference	Direct teaching	Lecturing Discussion Whiteboard Power point	K1,K2,S1,S3,S4;S5;C1,C2	
2/1/2024	Young's double slit experiment	Direct teaching	Short videos Assignment5	K1,K2,S2	332-337
7/1/2024	Production of Polarized light	Direct teaching	Lecturing Discussion Whiteboard Power point	K1,K2,S1,S3,S4;S5;C1,C2	353-359
9/1/2024	Diffraction pattern of light	Direct teaching	Lecturing Discussion Whiteboard Power point	K1,K2,S1,S3,S4;S5;C1,C2	406-413
14/1/2024	Fraunhofer diffraction	Direct teaching	Short videos Assignment6	K1,K2,S1,S3,S4;S5	406-413
16/1/2024	Fresnel Diffraction	Direct teaching	Lecturing Discussion Whiteboard Power point	K1,K2,S1,S3,	406-413
21/1/2024 - 1/2/2024	Final Exam				

Education procedures: (Direct, synchronous, asynchronous). ** Refer to document (CC-2023-04) ***Reference: Pages of the book, number of the chapter, recorded lecture, video....)

Eighth: Assessment methods

Methods	Fully Electronic Education	Integrated Teaching	Direct Teaching	Specific Course Output to be measured										
				*State the score identified for each CILO for each method of assessment out of 100 **If any CILO will not be assessed in the course, mark NA.										
				K1	K2	S1	S2	S3	S4	C1	C2	C3	C4	C5
Mid-term Exam			35	15	15	5								
Final Exam			50	19	21				5	5				
Quiz1			5			5								
Quiz2			5						5					
Assignment			5							5				
Total out of 100			100	34	36	10			10	10				

* Refer to document (CC-2023-03)

Ninth: Course Policies

- Meeting the deadline for the lecture.
- Commitment to interaction and participation.
- Interactive lectures will be given through a platform (MS Teams).
- Duties and tests will be given through a platform (Moodle).
- Commitment to the right appearance with the proper background in front of the camera.
- University regulations for attendance and absence from lectures and examinations are in force.
- Academic Integrity: According to university regulations and instructions, fraud or moral impersonation is unacceptable and punishable.

Approval	Name	Date	Signature
Head of Department	Dr. Riad		
Faculty Dean	Dr. Aliaa Burqan		