MODULE DESCRIPTION FORM

Module Information					
Module Title	Optics			**Module Delivery**	
Module Type	**Core**			☒**Lecture**	
Module Code	**MPH2022**			☒**Lab**	
ECTS Credits	**6**			☒**Practical**	
SWL (hr/sem)	**150**				
Module Level	2		**Semester of Delivery**	1	
Administering Department	MPH		**College**	College of Science	
Module Leader	**Hikmat Adnan Jawad**		**e-mail**	hikmatadnan@gmail.com	
Module Leader's Acad. Title	Assistant Professor Dr		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Ali Nazem Munaf		**e-mail**	Ali.n@uowa.edu.iq	
Peer Reviewer Name	**Ahmed Mousa Jaafar**		**e-mail**	Ahmed.mo@uowa.edu.iq	
Scientific Committee Approval Date	1 – 9 - 2025		**Version Number**	1.0	

Relation with other Modules			
Prerequisite module	-	**Semester**	1
Co-requisites module	-	**Semester**	1

Department Head Approval **Dean of the College Approval**

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	1- Identify the meaning of optics. 2- Identify the refractive index, optical path, critical angle, total internal reflection, 3- medical applications of light, as well as defining interference, diffraction, and polarization. 4- Determine the importance of light in the medical field. 5- Identify thin and thick lenses and study image formation. 6- Study the tools related to these phenomena and determine the components of the images formed. 7- Studying optical devices, focusing on the human eye, and paying attention to visual defects. 8- Learn about the diffraction experiment, Newton's rings, Lloyd's mirror. 9- Fraunhofer diffraction, Fresnel diffraction, and prism diffraction.
Module Learning Outcomes	1- Know about the Nature and propagation of light, And electromagnetic spectrum 2- Know about the Optical path of light in the optical mediums and Reflection And low. 3. Know about the refraction at spherical surface. 4. Know about the Critical angle, total internal reflection and Dispersion of light 5- Know about the Mirrors and Magnification of images in mirrors 6- Study the most important optical devices that can be used during their employment. 7- Learn about the diffraction experiment. 8 - Study thin Lenses and Lens maker's equation. 9- Providing scientific material that relates to the scope of their work and is specialized as a medical physics department.
Indicative Contents	Theory Lectures Learning concepts of each theoretical lecture or groups of lectures. Lab. Lectures Learning concepts of each laboratory lecture or groups of lectures. Mid Exam = 1hrs Final Exam =3hrs

Learning and Teaching Strategies	
Strategies	1. Lecture 2. Workshops 3. Laboratory sessions 4. Flipped classroom 5. Problem-based learning (PBL) 6. Peer teaching and collaborative learning 7. Reflective practice

Student Workload (SWL)			
Structured SWL (h/sem)	78	**Structured SWL (h/w)**	5.2
Unstructured SWL (h/sem)	72	**Unstructured SWL (h/w)**	4.8
Total SWL (h/sem)	150		

Module Evaluation								
		Time/Number		Weight (Marks)		Week Due	Relevant Learning Outcome
		TH	LAB	TH	LAB		
Formative assessment	Quizzes	2	2	4	10	5 and 11	3,9
	Homework assignment	2	1	4	10	6and 13	1,8
	Onsite Assignments	-	-	-	-	-	-
	Projects	1	7	2	10	14	All
Summative assessment	Midterm Exam	1		10		7	
	Final Exam	3hr		50		15	
Total assessment				100 Marks			

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Nature and propagation of light, And electromagnetic spectrum.
Week 2	Optical path of light in the optical mediums and Reflection
Week 3	Optical path of light in the optical mediums and Reflection
Week 4	Critical angle , total internal reflection and Dispersion of light
Week 5	Mirrors and Magnification of images in mirrors
Week 6	Thin Lenses and Lens maker's equation
Week 7	Mid. Exam
Week 8	Compound lenses and equivalent focal length
Week 9	Optical Devices, The eye, defect of visions,
Week 10	The Human Visual System, eye diseases.
Week 11	Transverse wave, The wave equation in the medium , Superposition of Waves and Coherent and incoherent sources, Relation between Phase Difference and Path Difference
Week 12	thin film, HOLOGRAPHIC TECHNOLOGY, Interference phenomena, Young's Experiment and Intensity Distribution in the Young's Experiment.
Week 13	Diffraction Phenomena and types of diffractions ,Fraunhofer diffraction and Single Slit Diffraction (Fraunhofer Diffraction)
Week 14	Double-Slit Diffraction Pattern and Diffraction
Week 15	Grating and Dispersion power of grating and Resolving Power.

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	Finding the focal length of a convex lens

Week 2	Measurement of diameter of wire using laser diffraction
Week 3	Measurement the refractive index of a liquid by refractometer
Week 4	Laser Diffraction
Week 5	Find the refractive index for prism using spectrometer
Week 6	Polarimeter
Week 7	Find the focal length for a concave lens by using convex lens
Week 8	find the specific rotation of sugar solution by using a polarimeter and sugar solutions of different concentrations.
Week 9	measurement of the wavelength of monochromatic light using the laser.
Week 10	Study solution concentration using Beer – Lamber.
Week 11	Brewster angle measurement.
Week 12	Study the phenomenon of diffraction via grating.
Week 13	find the focal length for a concave lens.
Week 14	Laser Diffraction
Week 15	Finding the focal length of a convex lens
Week16	Final Exam

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	Fundamental of Optics, by Jenkins and White	No
Recommended Texts	Introduction to Modern optics, by Grant R. Fowlles Optics, by Miles and Thomas ear, Publisher.	No
Websites	https://phet.colorado.edu/ar_SA/ https://michaelbach.de/ot/ https://science.nasa.gov/ems/09_visiblelight https://w3.aapm.org/media/index.php https://phet.colorado.edu/sims/html/geometric-optics/latest/geometric-optics_all.html?locale=ar_SA	

Grading Scheme				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	Excellent	90 - 100	Outstanding Performance
	B - Very Good	Very Good	80 - 89	Above average with some errors
	C - Good	Good	70 - 79	Sound work with notable errors
	D - Satisfactory	Satisfactory	60 - 69	Fair but with major shortcomings
	E - Sufficient	Sufficient	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	Fail	(45-49)	More work required but credit awarded
	F – Fail	Fail	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.