	Ministry of Higher Education and Scientific Research - Iraq Al-Nahrain University College of Science Physics Department	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	OPTICS			**Module Delivery**	
Module Type	CORE			☒**Theory** ☐**Lecture** ☒**Lab** ☒**Tutorial** ☒**Practical** ☐**Seminar**	
Module Code	MPHY3104				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	3		**Semester of Delivery**	1	
Administering Department	Medical physics		**College**	College of Science	
Module Leader	Dr. Ahmed H. Flayyih		**e-mail**	ahmed.hmood@nahrainuniv.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Dr.sarah abd karim		**e-mail**		
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**Version Number**	1.0	

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	1
Co-requisites module	None	**Semester**	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	Module aims in optics generally focus on developing a deep understanding of light, its fundamental properties, and how it interacts with matter, including concepts like geometrical optics, physical optics, polarization, interference, and diffraction. They aim to equip students with the ability to apply these principles to solve optical problems, understand the operation of optical instruments, analyze optical systems, and prepare them for advanced study or careers in optics-related fields		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Module learning outcomes for an optics course include the ability to explain and apply principles of geometric optics, such as reflection and refraction, analyze wave phenomena like interference and diffraction, describe the polarization of light, understand the working principles of optical instruments, calculate properties of optical systems, and apply optics concepts to solve problems in various contexts, from everyday phenomena to advanced technologies. .		
Indicative Contents المحتويات الإرشادية	Chapter One: Properties of Light Chapter Two: Mirror , Lenses and prism Chapter Three: Interference Chapter Four: Diffraction		
Learning and Teaching Strategies استراتيجيات التعلم والتعليم			
Strategies	The learning strategy depends on the following: 1. Feeding the student with theoretical foundations and concepts from theoretical lectures 2. Daily and semester tests 3. Assigning students to solve the required mathematical problems and discussing them during the class		

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	94	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	31	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	3	15% (15)	3, 6, 8	LO #1,
	Assignments	2	10% (10)	5, 12	LO # 3, 4
	Projects / Lab.	1	15% (15)	Continuous	LO#, 1, 2 AND 3
	Report	-------	----------	-	
Summative assessment	**Midterm Exam**	3 hr	10% (10)	9	LO#,3
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	General Introductions
Week 2	Chapter one: light speed, optical path, refractive index, Laws of Reflection and Refraction,
Week 3	Fermat's Principle, Critical angle and total internal reflection**,** Tutorials
Week 4	Chapter Two: General concept, Focal Point, Real and Virtual Image, Sign Convention
Week 5	Concave Mirror, Mirror Formula, Magnification by Mirror
Week 6	Convex mirror, Tutorials
Week 7	Concave and Convex lenses
Week 8	Chapter3: Interference by Division of Wave Front, INTERFERENCE OF TWO BEAMS OF LIGHT, HUYGENS' PRINCIPLE, YOUNG'S EXPERIMENT, INTERFERENCE FRINGES FROM A DOUBLE SOURCE
Week 9	**Mid-term exam**

Week 10	Other Apparatus Depending on Division of The Wave Front Including
Week 11	Interference by Division of Amplitude including, Michelson Interferometer
Week 12	Chapter4: Fraunhofer Diffraction, The Single-Slit Diffraction
Week 13	The Double-Slit Diffraction, MAXIMA AND MINIMA MISSING ORDERS,
Week 14	THE DIFFRACTION GRATING
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Instructions to students, Basic personal needs and other requirements. Writing the account of an experiment, Introduction to graphical representation of experimental data, Errors, their determination and minimization, least square fitting. Units.
Week 2	Lab1:
Week 3	Lab 2:
Week 4	Lab 3:
Week 5	Lab 4:
Week 6	Lab 5:
Week 7	Lab 6:
Week 8	Lab 7:
Week 9	Lab 8:
Week 10	Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Fundamentals of Optics: 4th Edition/ Shirley Grall Geometrical Optics/ E. R. Huggins/ Dartmouth College	Available
Recommended Texts		Available
Websites	https://pandaveswarcollege.ac.in/wp-content/uploads/2025/01/Fundamentals-of-Optics-4th-Edition.pdf https://www.spiedigitallibrary.org/ebooks/PM/Fundamentals-of-Optics-An-Introductory-Course/1/Fundamentals-of-Optics-An-Introductory-Course-Full-Book/10.1117/3.2660873.sup https://www.routledge.com/Fundamentals-of-the-Optics-of-Materials-Tutorial-and-Problem-Solving/Gavrilenko-Ovechko/p/book/9789814877930?srsltid=AfmBOorZJoVH7m5caW0wgSKYlEIKXGL3mdPPOCObIRficjczRxrjUwV6	

APPENDIX:

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

NB 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.



ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي