MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Optics**			**Module Delivery**	
Module Type	**C**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOMU031032**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		2	**Semester of Delivery**		3
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Duaa jaafer dheaa		**e-mail**	Duaa.jaafer.dheaa@uomus.edu.iq	
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	

Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Understand the anatomy and physiology of the eye, including the cornea, lens, retina, and optic nerve. 2. Define key terms related to eye optics, such as refraction, focal length, and astigmatism. 3. Explain the principles of Snell's Law and how it relates to the refraction of light in the eye. 4. Understand the different types of lenses used in eyeglasses and contact lenses, and how they correct common vision problems. 5. Analyze the properties of different types of corrective lenses and determine which lens would be most appropriate for a given patient. 6. Understand the causes and effects of common eye disorders, such as myopia, hyperopia, presbyopia, and astigmatism. 7. Describe the various surgical and non-surgical treatments available for correcting vision problems, including LASIK, PRK, and cataract surgery. 8. Understand the importance of regular eye exams in detecting and preventing eye diseases and maintaining good eye health.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate an understanding of the basic principles of light and vision, and how these principles apply to the human eye. 2. Analyze the function and structure of the different parts of the eye, including the cornea, lens, retina, and optic nerve. 3. Evaluate the different types of refractive errors that can occur in the eye, such as myopia, hyperopia, and astigmatism, and how these can be corrected with lenses or surgery. 4. Apply knowledge of optic aberrations and common eye diseases to diagnose and treat visual impairments. 5. Develop an understanding of current and emerging technologies used to correct vision, such as LASIK and other surgical procedures. 6. Understand the importance of a comprehensive eye exam and how to perform

	one, including assessment of visual acuity, visual field, and color vision.
Indicative Contents المحتويات الإرشادية	1. Introduction to Eye Optics 2. Anatomy and Physiology of the Eye 3. Refraction and Reflection of Light 4. Properties of Lenses and Mirrors 5. Principles of Image Formation 6. Vision Correction Methods (Eyeglasses, Contact Lenses, Refractive Surgery) 7. Aberrations of the Eye 8. Color Vision 9. Optical Illusions and Perception 10. Eye Diseases Related to Optics

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Visual Aids: Use visual aids such as diagrams, charts, or videos to help students understand the concepts of eye optics. It can help them visualize the concepts and make them more engaging. 2. Interactive Learning: Encourage students to participate in activities and experiments to explore the concepts of eye optics. This can include hands-on activities such as constructing a model eye, or simulations that help students understand the behavior of light. 3. Gamification: Implement gamification strategies such as quizzes, puzzles, or games to make learning more enjoyable and engaging for students. 4. Group Discussions: Encourage students to discuss the concepts of eye optics in groups. This can help them develop critical thinking skills as they learn to analyze and interpret complex information. 5. Real-world Applications: Connect the concepts of eye optics to real-world applications such as eyeglasses, contact lenses, or the workings of the human eye. This can help students understand the relevance of what they are learning.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	109	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	91	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Light and vision: introduction; light waves; light velocity; light rays and beams; electromagnetic spectrum.
Week 2	Reflection: definition; Reflection at plan surfaces; regular Reflection; irregular reflection image formation by plane mirror; direction of image seen by eye.
Week 3	Lenses: definition; focal length; lens power; types; Prism (dispersion).
Week 4	Reflection at curved mirror, spherical mirror, type of spherical mirror, rays' diagram for a concave and convex
Week 5	Eye physics; Eye: definition; parts; focusing element; photoreceptors cells; accommodation.
Week 6	Refraction errors: emmetropia; ametropia; myopia; hypermetropia.
Week 7	Presbyopia; astigmatism.
Week 8	Eye: definition; parts; focusing element; photoreceptors cells; accommodation.
Week 9	Laser: definition; essential; phenomena; properties. Laser cavity: laser types, laser in medicine.
Week 10	Eye strain
Week 11	amblyopia Muscle anomalies
Week 12	Convergence with accommodation
Week 13	Mechanism of accommodation; Spasm of accommodation; Paralysis of accommodation
Week 14	Treatment of refractive errors

Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Reflection: definition; Reflection at plan surfaces; regular Reflection; irregular reflection image formation by plane mirror; direction of image seen by eye.
Week 2	Lenses: definition; focal length; lens power; types.
Week 3	Indirect Optical infinity Ophthalmoscope.
Week 4	Visual acuity: introduction; definition; measurements; applications.
Week 5	Refraction of the eye; Near point; Far point
Week 6	Correction of myopia with medical lenses
Week 7	Treatment of Hypermetropia

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	"Clinical Optics" by Andrew R. Elkington and Helena J. Frank. “Handbook of Optics "2nd ed .Vol .III “Classical, Vision and x-ray optics” by Michael	Yes
Recommended Texts	"Optics, Light and Lasers: The Practical Approach to Modern Aspects of Photonics and Laser Physics" by Dieter Meschede.	Yes
Websites	https://www.aao.org/ , https://www.nei.nih.gov/	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(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.