Module Information

معلومات المادة الدراسية

Module Title	**Laser Basics**	**Module Delivery**	
Module Type	**C**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☒**Practical** ☒ **Seminar**	
Module Code	**UOMU0301055**		
ECTS Credits	**5**		
SWL (hr/sem)	**125**		

Module Level	3	**Semester of Delivery**	5
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	Name ali slman hamadi	**e-mail**	ali.slman.hamadi@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	The course aims to study the concepts and basics of lasers, the principle of its science, the characteristics and advantages of lasers such as (directivity and brightness, mono-wavelength and diffraction) and its scientific applications and pumping methods such as (electrical, chemical and optical pumping), laser components and types of lasers (solid and liquid state lasers and invasive).
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the basic principle of laser work 2. Distinguish between pulsed and continuous lasers 3. Explain the techniques of laser work in eye and dental surgery and the removal of cancerous tumors 4. Understand the meaning of spontaneous and catalytic absorption and emission The program's skill objectives . 5. solve problems related fundamentals of pulse time . 6. solve problems related to the laser operating cycle . 7. fundamentals of.
Indicative Contents المحتويات الإرشادية	An introduction of laser, Laser properties ,and basic principle of laser work , and how used in medical application, explain the Spontaneous and catalyzed emission and how it occurs, pumping and explain electrical, chemical and optical pumping, explain the uses and types of lasers, solve problems related fundamentals of pulse time .

Learning and Teaching Strategies استراتيجيات التعلم والتعلم	
Strategies	8. Lectures 9. Discussion 10. Teaching strategies to be used to develop these skills and abilities 11. Lab work 12. Case Study 13. Active learning 14. Small group discussion 15. Evaluate the efforts of each student in preparing the report. 16. Evaluate the scientific values of reports. 17. Evaluate the work in team 18. Evaluation of the role of each student in lab group assignment

Student Workload (SWL)

الحمل الدراڤ للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراڤ المنتظم للطالب خلال الفصل	60	**Structured SWL (h/w)** الحمل الدراڤ المنتظم للطالب أسبوعنا	4
Unstructured SWL (h/sem) الحمل الدراڤ غ المنتظم للطالب خلال الفصل	65	**Unstructured SWL (h/w)** الحمل الدراڤ غ المنتظم للطالب أسبوعنا	25
Total SWL (h/sem) الحمل الدراڤ الڤ للطالب خلال الفصل	**125**		

Module Evaluation

تقيم المادة الدراسنة

		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 الاسبو ر النظري

	Material Covered
Week 1	Properties of light.

Week 2	Properties of laser light.
Week 3	Absorption and emission of light.
Week 4	Poltezman distribution.
Week 5	Laser process.
Week 6	Element of laser.
Week 7	First Exam .
Week 8	Lasing action.
Week 9	Types of laser.
Week 10	Exponetioal law of absorption.
Week 11	Absorption as a function of wave length.
Week 12	Focal spot size of laser.
Week 13	Optical cavity and laser gain.
Week 14	Discussion & Tutorials.
Week 15	Second exam.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبو؛ للمختر	
	Material Covered
Week 1	Lab 1: Directional experience.
Week 2	Lab 2: Measure the laser diffraction beam.
Week 3	Lab 3: Young experience.
Week 4	Lab 4: laser beam divergence .
Week 5	Lab 5: Spectroscopy experiment.
Week 6	Lab 6: Gaussian experiment.

Week 7	Lab 7: Determine the wavelength of the laser using the diffraction method.

Learning and Teaching Resources مصادر التعلم والتدرنس		
	Text	**Available in the Library?**
Required Texts	Siegman, A. E. (1986). Lasers. University science books. Williams, D. (2008). Laser basics. *Anaesthesia & Intensive Care Medicine*, *9*(12), 550-552. Eichler, H. J., Eichler, J., & Lux, O. (2018). Lasers: basics, advances and applications.	Yes
Recommended Texts	Introduction to Laser Physics . Principles of Lasers. Laser and their medical application.	Yes
Websites	https://www.britannica.com/technology/laser/Fundamental-principles	

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.