

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<b>Medical Laser Applications</b>		Module Delivery	
Module Type	C		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	<b>UOMU0301063</b>			
ECTS Credits	5			
SWL (hr/sem)	<b>125</b>			
Module Level	3	Semester of Delivery		1
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	م.م علي سلمان حمادي عيسى		e-mail	ali.slman.hamadi@uomus.edu.iq
Module Leader's Acad. Title			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

<b>Module Aims</b> أهداف المادة الدراسية	The course aims to study the applications of lasers in medicine, to know these applications represented in ophthalmology surgery, to know the common diseases that affect the eye and how to treat them using lasers, as well as to know the advanced and modern techniques in treatment. And also study. The uses of lasers in dentistry and knowledge of diseases that are treated by lasers, such as gum disease, regular and root fillings, oral bone surgery such as the use of orthodontics, as well as cosmetic operations, tattoo removal and cancerous tumors, as well as studying the interaction of lasers with tissues, understanding how light is absorbed by tissues, as well as understanding thermal properties The tissue enables the student to understand laser surgery, urology, cardiology, and neurology
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Understand the interaction of laser with tissue</li><li>2. Distinguish between pulsed and continuous lasers Basic details to the article</li><li>3. Explain the mechanism of plastic surgery and tattoo removal</li><li>4. Understand the meaning of spontaneous and catalytic absorption and emission.</li><li>5. Know the techniques used in the treatment of teeth and eyes</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<ol style="list-style-type: none"><li>1. Introduction to medical laser applications</li><li>2. Basics of laser physics and properties of laser light</li><li>3. Interaction of laser light with biological tissues</li><li>4. Laser safety and regulatory requirements</li><li>5. Applications of lasers in diagnosis and therapy</li><li>6. Laser therapies for dermatology and aesthetics</li><li>7. Laser surgery and minimally invasive procedures</li><li>8. Lasers in ophthalmology and otolaryngology</li><li>9. Lasers in dentistry and oral surgery</li><li>10. Emerging laser technologies and their potential applications</li></ol>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<ol style="list-style-type: none"><li>19. Lectures</li><li>20. Discussion</li><li>21. Teaching strategies to be used to develop these skills and abilities</li><li>22. Lab work</li><li>23. Small group discussion</li><li>24. Evaluate the scientific values of reports.</li><li>25. Evaluate the work in team</li></ol>
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	60	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	65	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	25
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	<b>Assignments</b>	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	<b>Projects / Lab.</b>	1	10% (10)	Continuous	
	<b>Report</b>	1	10% (10)	13	LO # 5, 8 and 10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	Introduction of laser in medicine
<b>Week 2</b>	Pulsed Lasers Introduction to Power and Energy Calculations
<b>Week 3</b>	Laser eye surgery
<b>Week 4</b>	Types of techniques used in eye surgery
<b>Week 5</b>	Laser in dentistry
<b>Week 6</b>	Uses of Laser in dentistry
<b>Week 7</b>	First exam
<b>Week 8</b>	Using laser to treat cancer
<b>Week 9</b>	Photodynamic therapy
<b>Week 10</b>	Lithotripsy

Week 11	Laser nitration with tissue
Week 12	Laser skin treatment
Week 13	Treating heart disease with laser
Week 14	Laser safety classification
Week 15	Second Exam

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Characteristics study of Gaussian beam TEM
Week 2	Lab 2: Radiation shield
Week 3	Lab 3: Calculate the thickness of a glass can
Week 4	Lab 4: Loss of power in an optical fiber
Week 5	Lab 5: laser radiation transmission by material mediums
Week 6	Lab 6: Study of the properties of a semiconductor laser
Week 7	Lab 7: A study of the installation of a helium-neon laser and the calculation of the resonator's ball diameter

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Azadgoli, B., & Baker, R. Y. (2016). Laser applications in surgery. <i>Annals of translational medicine</i> , 4(23).	Yes
Recommended Texts	Handbook of laser technology and applications Problems in laser physics Laser Physics and Applications	Yes
Websites	<a href="https://www.britannica.com/technology/laser/Fundamental-principles">https://www.britannica.com/technology/laser/Fundamental-principles</a>	

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX</b> - Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> - 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.