	Ministry of Higher Education and Scientific Research - Iraq University of Al Muthanna College of Applied of Medical Sciences Department of Environmental Health	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	MEDICAL PHYSICS			**Module Delivery**	
Module Type	BASIC			Theory ✓ Lecture✓ Lab✓ Tutorial✓ Practical Seminar✓	
Module Code	CLA1101				
ECTS Credits	7				
SWL (hr/sem)	157				
Module Level		1	**Semester of Delivery**		1
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Ammar nadal shareef		**e-mail**	ammarnadhal@mu.edu.iq	
Module Leader's Acad. Title		PhD	**Module Leader's Qualification**		
Module Tutor	PhD		**e-mail**	ammarnadhal@mu.edu.iq	
Peer Reviewer Name			**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**		

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 Aims أهداف المادة الدراسية	Provide the student with practical and theoretical information on how to study medical physics and follow modern methods in linking physics and medicine.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Enable the student to know and understand the science of medical physics. 2. Enable the student to know and understand how the pressure rises on each part of the body. 3. Enabling the student to know and understand the types of radiation and their risks to humans and the environment and the diseases that affect humans as a result of exposure to large amounts of radiation. 4. Enabling the student to know and understand how a rise or fall in human body temperature occurs. 5. Providing the student with skills in how to detect the electrical brain. 6. Providing students with skills in the process of measuring human body pressure and its types. 7. Providing the student with skills in how to link physics and medicine.

Indicative Contents المحتويات الإرشادية	1. A general introduction to everything related to physics and its connection to mathematics and medicine and its impact on the human body 2. Pressure , Negative Pressure , Boyle s Law, Pressure inside the Skull , Pressure in Eye , Pressure in Skeleton, Pressure in the Urinary Bladder, , Pressure in the Lung , Hyperbaric Oxygen Therapy (HOT) 3. Energy, Work and Power of the Body, Kinetic Energy and PPotential Energy, The Basal Metabolic Rate,The main heat loss Mechanisms in the Body. 4. Laser, How laser works , Properties of Laser, Types of Laser, General Safety Practices while Working , Laser dangers , Laser uses in Medicine , Laser Applications in the Medical Field . 5. Electricity within the body and the nervous system Neurons and their components, 6. Physics of Nuclear Medicine and Medical and Biological of Radiation, Physics of Radioisotopes in Medicine and type of Ray and effects, Radiation Protection. 7. Physics of Diagnostic X-Ray, X-Ray Production, X-ray Properties, Types of X-Ray, Medical Application, Dental Radiography, Chest X-Ray, Mammography, Mammography, Fluoroscopy, Computed Tomography, Radiotherapy, X-Ray Exposure of Pregnant Woman, Prevention, X-Ray Risks. 8. CT-Scan , MRI , ECG , EEG The working principle of each device, its characteristics, uses, benefits and harms 9. Sound in Medicine , Types of Sound Waves Properties of Sound Waves , The use of Sound Waves in Medicine Sound Wave Applications Stethoscope. 10. Heat and Cold in Medicine, Heat and Temperature, Thermometry and Temperature Scales , Types of Thermometers, Heat therapy, Heat production for therapy, Cryogenics Cryosurgery is used in several types of eye surgery. 11. light in medicine , The electromagnetic spectrum , Phototherapy Diseases treated with light , Advantages of phototherapy, Phototherapy side effects The benefits of light therapy 12. General concepts: Method of physics and standards; thermodynamics system and system properties; conservation of energy principle, application of thermodynamics, The Zeroth law. 13. The 2nd law of thermodynamics; reversible and irreversible process , Entropy and Enthalpy; Enternal energy; heat capacity and Adiabatic process; the relation between pressure, volume, and temperature in adiabatic process.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	76	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	99	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	1	5	3,5,7,9,10,11, 13	1
	H.W	1.30	10	2,4,8,12,13	2
	seminar	6	6	2,4,8,12,13	3
	Discussion /experiments	10	5	6,7,12,13,14	3,4,5
	Projects / Lab.	15	5	6,13,14	1,2,3,4,5
	Report/lab	9	9	1,2,3,4,5,8,9, 10,11	4,5,6
Summative assessment	**Midterm Exam**	1	10	6	1,2,3,4
	Final Exam	3	50	15	all
Total assessment			100		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Introduction of Medical Physics /Tutorial of Lecture (1)
Week 2	Pressure /Seminar
Week 3	Energy, Work and Power of the Body /Tutorial of Lecture (2,3)
Week 4	Laser /Seminar
Week 5	Electricity within the body /Seminar
Week 6	Med- term exam
Week 7	Radiation
Week 8	X-Ray /Tutorial of Lecture (7)
Week 9	Medical examination devices/ Tutorial of Lecture (8)
Week 10	Sound in Medicine /Tutorial of Lecture (9)
Week 11	Heat and Cold in Medicine /Seminar
Week 12	Light in medicine /Seminar
Week 13	Thermodynamics /Seminar
Week 14	Thermodynamics,/Tutorial of Lecture,8,9)
Week 15	Final exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
weeks	**Material Covered**
Week 1	EXP1: Force table.
Week 2	EXP2: Boyle's Law.
Week 3	EXP3: Hooke's Law.
Week 4	EXP4: Blood Pressure Measurement by Using Sphygmomanometer.
Week 5	Med- term exam
Week 6	EXP5: Determination of the refractive index of water (or any liquid).
Week 7	EXP6: Viscosity in Liquid.
Week 8	EXP7: Finding the focal length of a convex lens.
Week 9	EXP8: Speed of sound.
Week 10	EXP9: Laser application for measurement of single slit.
Week 11	EXP10: Measurement of the wavelength separation of sodium using diffraction grating.
Week 12	EXP11: Surface Tension.
Week 13	EXP12: Determination of the Acceleration of Gravity by Means of Simple Pendulum.
Week14	EXP13: Determine the coefficient of static friction between two surfaces
Week 15	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Physics by Bern& Medical physics by camerom	
Recommended Texts	Medical and clinical physics and internet	
Websites	/https://www.medphys.org	

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