Republic of Iraq
Ministry of Higher Education and Scientific Research
AL-Mustaqbal University
College of Sciences
Department of medical Biotechnology

جمهورية العراق
وزارة التعليم العالي والبحث العلمي
جامعة المستقبل
كلية العلوم
قسم التقنيات الاحيائية الطبية

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Biophysics			Module Delivery	
Module Type	B			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	UOMU 037014				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	UGx11 1		Semester of Delivery	1	
Administering Department	Type Dept. Code		College	Type College Code	
Module Leader	Name: Sarah Mahdi obiad		e-mail	E-mail: sarah.mahdi@uomus.edu.iq	
Module Leader's Acad. Title	Assistant 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			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. This course is designed to give students in non-physics departments a basic background in physics.

	2. Developing quantitative and analytical skills for the students and their understanding of the fundamental principles. 3. Teaching the students the skill of dealing with physical nature and trying to find solutions to scientific problems. 4. Making the student possess the intellectual skill in thinking about solving some scientific problem through mathematical and physical equations. 5. Work to provide a foundation for understanding and applying scientific principles to real-world situations. 6. The course will aim to bring together the principles and methodologies of physics and biology to study living systems. It seeks to understand biological phenomena using physical concepts, such as thermodynamics, electromagnetism, and statistical mechanics. 7. Give the idea of the physical processes that govern life, from the molecular level to cellular and organismal levels. It involves studying the structure and function of biomolecules, the mechanics of cellular processes, and the dynamics of biological systems. 8. Combining the principles of physics with the intricacies of biological systems to gain a deeper understanding of life.
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	**The module will focus on a number of concepts, models, laws, tools and techniques of physical science that underpin biophysical methods. It will address a broad range of challenging biological questions. During this module students will:.** 1. how to approach scientific problems with a focus on physical nature. They should learn problem-solving strategies and techniques specific to physics and be able to apply them to find solutions to scientific problems. 2. develop intellectual skills related to thinking about and solving scientific problems. This includes utilizing mathematical and physical equations as tools to analyze and understand phenomena in the physical world. 3. Understand the physical basis of experimental techniques used to study the biological systems introduced and explain the key results. 4. learn how to apply physical concepts such as thermodynamics, electromagnetism, and statistical mechanics to understand biological phenomena. 5. Students should gain knowledge about the structure and function of biomolecules, the mechanics of cellular processes, and dynamics of biological systems. 6. Demonstrate an understanding of the key physical principles behind several important biological processes underpinning living matter 7. Apply modern biophysical tools and techniques to real applications

Indicative Contents **المحتويات الإرشادية**	**In lecture lab #1-#5 they will need (16hr).** **In lecture lab #6- #13 they will need (50 hr).** **In lecture lab #- #15 they will need (20hr).**

Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	**To encourage students to participate in exercises, answer questions, theoretical and practical reports, seminars, conduct collective and individual skill tests, and theoretical, laboratory and field brainstorming. At the same time refine and expand critical thinking skills. This will be achieved through quizzes, interactive tutorials, and by thinking about the type of simple experiments that include some sampling activities that are of interest to the students**

Student Workload (SWL) **الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا**			
Structured SWL (h/sem) **الحمل الدراسى المنتظم للطالب خلال الفصل**	64	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	4
Unstructured SWL (h/sem) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	86	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	6
Total SWL (h/sem) **الحمل الدراسي الكلي للطالب خلال الفصل**	**150**		

Module Evaluation **تقييم المادة الدراسية**					
As		**Time/Number**	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	5	10	3, 5, 7, 11, 14	#1-#2, #3, #5,#6
	Assignments	2	10	9 and 13	#4 and #5
	Projects / Lab.	1	15	continuous	all
	Report	1	5	12	#7
Summative assessment	**Midterm Exam**	1h	10	8	#1-#6
	Final Exam	3h	50	16	all
Total assessment			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus) **المنهاج الاسبوعي النظري**	
Week	**Material Covered**

Week 1	**General concepts of biophysics**
Week 2	**use of correct physical units with numerical magnitudes, unit conversion skills, Scientific unit systems and unit types**
Week 3	**The laws of kinetic physics** **Interpretation of mechanical motion of bodies**
Week 4	**Application of Newton's laws in solving physical problems**
Week 5	**Surface tension**
Week 6	**Interpretation of Heat** **Analysis and interpretation of heat transfer between objects**
Week 7	**Heat laws and conversion of units used in this field**
Week 8	**Mid exam**
Week 9	**Radiations, sources, types**
Week 10	**Radiation doses** **Interpretation and analysis of the amount of radiation exposure**
Week 11	**Physical applications in diagnosis and treatment**
Week 12	**Ct-scan**
Week 13	**The waves, Classification of wave types, Sound waves**
Week 14	**Explain the phenomenon of the Doppler effect that occurs with sound waves** **Solve some exercises about the phenomenon of the Doppler effect**
Week 15	**Physics of blood pressure**
Week 16	**The preparatory week before the final exam**

Delivery Plan (Weekly Lab. Syllabus) **المنهاج الاسبوعي للمختبر**	
Week	**Material Covered**
Week 1	**Introduction** **Introducing the laboratory and the available equipment.** **Learn the basics of working in the laboratory.** **Safety procedures and proper methods in dealing with experiments**
Week 2	**Define the units of measurement used** **Conversion methods between measurement systems** Learn graphing skills and how to draw measured points **(Graphic fonts)**

Week 3	**Measurement of Acceleration Due to Gravity Using Simple Pendulum**
Week 4	**Ohm´s Law**
Week 5	**The surface tension**
Week 6	**Viscosity of liquid**
Week 7	**Boyle´s Law**
Week 8	**Hook's Law**
Week 9	**First Mid Exam**
Week 10	**Speed of sound**
Week 11	**The focal length of a convex lens**
Week 12	**Laser application for measurement of single slit**
Week 13	**The flow of water through a capillary tube as an introduction to decay curves and the study of half-life**
Week 14	**Blood Pressures**
Week 15	**Preparatory week before the final Exam**

Learning and Teaching Resources **مصادر التعلم والتدريس**		
	Text	**Available in the Library?**
Required Texts	1. Fundamentals of phhysics , Jearl Walker,Cleveland state University 8th edition,2008 2. Biophysics: An Introduction, Springer, dition,2010 3. physics in biology & medicine, academic press, 3th edition;2008from GE Healthcare, Handbook 4. Compendium of Medical Physics, Medical Technology and Biophysics, By Nico A.M. Schellart,2nd edition,2008	**yes**
Recommended Texts	College Physics – Volume 1, Author: Textbook Equity Open Education, https://www.infobooks.org/pdfview/3181-college-physics-volume-1-of-3-textbook-equity-open-education/	
Websites	1. https://www.ivsl.org	

Grading Scheme **مخطط الدرجات**				
Group	**Grade**	**التقدير**	**Marks %**	**Definition**
Success Group	**A - Excellent**	**امتياز**	**90 - 100**	**Outstanding Performance**

(50 - 100)	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.