	Ministry of Higher Education and Scientific Research - Iraq Al-Nahrain University College of Science Department of Medical Physics	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Sound and Waves			**Module Delivery**	
Module Type	CORE			☒**Theory** ☒**Lecture** ☒**Lab** ☒**Tutorial** ☒**Practical** ☒**Seminar**	
Module Code					
ECTS Credits	6				
SWL (hr/sem)	**150**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	Medical Physics		**College**	College of Science	
Module Leader	Dr. Saif Mohsin Nassrullah		**e-mail**	saif.muhsin@nahrainuniv.edu.iq	
Module Leader's Acad. Title	Lecture		**Module Leader's Qualification**	PhD	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Review Committee Approval	1/2/2026		**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	Students will gain knowledge of wave motion and acoustics. The properties of waves will be discussed. The effect of medium on the properties of waves will be covered.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	On successfully completing the module students will be able to: 1. Demonstrate knowledge and understanding of physical laws and principles, and their application to diverse areas of physics (this will include laws of motion, electromagnetism, wave phenomena and the properties of matter), with modules covering the necessary mathematics. 2- Have the understanding of the concepts of oscillatory motion, superposition of waves, sound, and electromagnetic waves. 3- Have experience with common mathematical and experimental tools including solving problems for this course. 4- Have skills in collecting and analyzing experimental data. 5. Demonstrate an ability to make use of appropriate texts, or other learning resources as part of managing their own learning.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **1. Introduction** A brief introduction to problem-solving in physics, Physical quantities (Standards and Units), errors, uncertainty, and some math. **2. Sound** ❖ Nature and Sources of Sounds. ❖ Characteristics of Sound. ❖ Properties of Sound. ❖ Transmission of Sound **3. Wave Motion** ❖ Waves and Wave Motion.

	❖ Kinds/Types of Waves. ❖ Characteristics of Waves. ❖ Properties of Waves
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The primary approach for introducing this unit will involve fostering student engagement through active participation in homework exercises, aiming to enhance and broaden their critical thinking abilities. This will be facilitated through class sessions and interactive tutorials, supplemented by the exploration of simple experiments designed to incorporate sampling activities tailored to students' interests.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction
Week 2	Mechanical Waves : Characteristics of waves
Week 3	Wavelength and frequency
Week 4	Speed and energy in a traveling wave
Week 5	Standing waves
Week 6	Sound Waves: The characteristics of sound wave
Week 7	The speed of sound
Week 8	Intensity of sound waves
Week 9	Superposition of sound waves (interference and beats)
Week 10	The Doppler effect
Week 11	Oscillations and Waves
Week 11	Simple harmonic motion
Week 12	**Mid Exam**
Week 13	Harmonic motion and circular motion
Week 14	The force law and Energy in simple harmonic oscillators
Week 15	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: The decrement of decaying oscillations is defined as the ratio of successive maxima
Week 2	Lab 2: Capacitor decay constant
Week 3	Lab 3: The velocity of sound by means of resonance tube closed at one end
Week 4	Lab 4: melde's experiment
Week 5	Lab 5: The bottle resonator
Week 6	Lab 6: Optical determination of velocity of sound in liquids
Week 7	Lab 7:

Week 8	Lab 8:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Vibrations Waves and Sounds, Second Edition, 2013, ANYAEGBUNAM F.N.C.	Yes
Recommended Texts	THE PHYSICS OF VIBRATIONS AND WAVES Sixth Edition 2005,H. J. Pain Formerly of Department of Physics, Imperial College of Science and Technology, John Wiley & Sons LtdLondon, UK	Yes
Websites	file:///C:/Users/MICROSOFT/Downloads/Book5VibrationsWavesandSounds.pdf http://fizica-c-11.phys.uaic.ro/Pain%20PHYSICS%20OF%20VIBRATIONS%20AND%20WAVES%206-th%20Edition.pdf	

APPENDIX:

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