

Ministry of Higher Education and Scientific Research - Iraq Al-Nahrain University College of Science Mathematics and Computer Applications Department



## MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدر اسية						
Module Title	Mechanic physics			Modu	le Delivery	
Module Type		Basic			I Theory	
Module Code		CREQ1111			🛛 🗵 Lecture	
ECTS Credits	5				🛛 🖾 Lab	
					🗆 🗆 Tutorial	
SWL (hr./Sem)	125					
				🗆 Seminar		
Module Level		1	Semester of	Delivery 1		1
Administering Department		Mathematics and Computer Applications	College	College of Science		
Module Leader Dr. Ammar A. Alrawi		Alrawi	e-mail	ammar.alrawi@nahrainuniv.edu.iq		<u>iniv.edu.iq</u>
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification Ph.D		Ph.D.	
Module Tutor Dr. Ammar A. Alrawi		e-mail	ammar.alrawi@nahrainuniv.edu.iq			
Peer Reviewer Name		Name	e-mail			
Scientific Committee Approval Date		8/11/2023	Version Nu	ersion 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 Aims	1. Introduce students to basic concepts related to static and mobile			
	systems.			

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أهداف المادة الدر أسيه	2. Introducing the student to the methods of classifying mechanical
	systems, the laws related to them, and the life applications that simulate
	their theories.
	3. Introducing the student to the methods of mathematical solutions to
	problems related to kinetic systems
	1. Providing the student with sufficient experience to deal with kinetic
Madula Laguning	systems according to the mathematical theories and laws compatible with
Module Learning	them
Outcomes	
	2. Enhancing the student's mental ability to analyze kinetic systems according
مخرجات التعلم للمادة الدراسية	to those theories to find the required solutions to the problems that the
	student may foce during study and after anduction
	student may face during study and after graduation.
	The instructional content includes the following:
	In our practical life we need to indicate the location of an object, whether it is
	stationary, non-stationary, or moving, and to determine the location of that
	object we use so-called "coordinates." There are several types of coordinates
	we can apply, such as rectangular coordinates and polar coordinates. And
	studying the usefulness of applying vectors in our lives [6 hours]
	Mechanics is one of the branches of physics that studies motion, and includes
	two main sections: kinematics, a science that describes the motion of objects
	without paying attention to the causes of motion. (Dynamics) is a science
	concerned with the causes of movement such as force and energy. We will first
	learn about the concepts of position, displacement, velocity and acceleration of
	objects to move in one dimension and in two dimensions with some
	nomenclature [10 hours]
Indicative Contents	
المحتودات الإرشاردة	Physicist Isaac Newton based his theory of motion through three laws known
،ــــــــــــــــــــــــــــــــــــ	as Newton's laws of motion, where he described the forces acting on the
	motion of bodies by these laws and the difference between mass and weight. [6
	hours]
	While solving an exercise in kinesiology it is important to correctly analyze
	the forces acting on the body or system, and therefore the body. The forces
	acting on it will be illustrated, and this method is called a free body diagram. [4
	hours]
	The concept of equilibrium, tensile equilibrium, rotational equilibrium, torque,
	vector torque, couple, center of mass, center of gravity. [10 hours] Work,
	Energy, Energy, Momentum, Energy Type [6 hours]
	Explain periodic motion, rotational motion, simple harmonic motion,
	relationship between uniform circular motion and simple harmonic motion,
	simple pendulum, simple harmonic motion, wave motion [10 hours]

Learning and Teaching Strategies				
استر اتيجيات التعلم والتعليم				
Strategies	1. Enabling students to solve problems related to the theoretical framework of the lecture material.			

2. Enabling students to thinking about life problems related to the subject
of the lecture.
3. Linking the lecture curriculum with practical applications, especial
with our daily life.

Student Workload (SWL)				
الحمل الدر اسي للطالب محسوب لـ ١٥ اسبو عا				
Structured SWL (h/Sem)	62	Structured SWL (h/w)	4	
الحمل الدراسي المنتظم للطالب خلال الفصل	05	الحمل الدراسي المنتظم للطالب أسبو عيا	4	
Unstructured SWL (h/Sem)	62	Unstructured SWL (h/w)	/ 12	
الحمل الدراسي غير المنتظم للطالب خلال الفصل	02	الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.13	
Total SWL (h/Sem)	125			
الحمل الدر اسي الكلي للطالب خلال الفصل	125			

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

Delivery Plan (Weekly Syllabus)					
المتهاج الأشبوعي النظري					
	Material Covered				
	Introduction to vectors:				
Week 1	Scalar Quantity, Vector quantity, resultant, graphical addition of vectors, Parallelogram				
	method, subtraction of vectors, trigonometric functions, components of a vector, unit vectors				
Week 2	Introduction to vectors: Problem solving				

	Equilibrium under the action of concurrent forces:
Week 3	Concurrent forces, an object in equilibrium, first condition in equilibrium, Problem solution
	method.
Week 4	Equilibrium under the action of concurrent forces: Problem solving
Mook F	Equilibrium under the action of coplanar forces:
week 5	Torque or momentum, two conditions for equilibrium, center of gravity
Week 6	Equilibrium under the action of coplanar forces: Problem solving
Week 7	Mid-term exam
Week 9	Uniformly accelerated motion:
week 8	Speed, velocity and acceleration. Uniformly accelerated motion on straight line, projectiles.
Week 9	Uniformly accelerated motion: Problem solving
	Newton's Laws:
Week 10	Mass, Force, External force. Newton first law, Newton second law, Newton third law.
	Law of universal gravitation. Weight. Types of forces.
Maak 11	Newton's Laws:
Week II	Problem solving
	Work, Energy and Power:
Week 12	Work, kinetic energy, gravitational potential energy, conservation of energy, Power,
	Kilowatt-hour
Week 13	Work, Energy and Power: Problem Solving
	Impulse and Momentum:
Week 14	Linear momentum, impulse causes change in momentum, conservation of linear momentum,
	collisions and explosions. Elastic collision, coefficient of restitution.
Week 15	A week of preparation before the final exam

Delivery Plan (Weekly Lab. Syllabus)				
المنهاج الأسبوعي للمختبر				
	Material Covered			
	Instructions to students, Basic personal needs and other requirements. Writing experiment			
Week 1	calculations, Introduction to graphical representation of experimental data, Errors, their			
	determination and minimization, least square fitting and units.			
Week 2	Forces and Equilibrium			
Week 3	Spiral Spring and Hooks Law			
Week 4	Simple Pendulum and determination of gravitational acceleration (g).			
Week 5	Surface tension measurement			
Week 6	calculate the refractive index of light using a moving microscope			

## Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	University Physics, By Zemansky and Young	No (Available as an e-book)
Recommended Texts	Fundamental of Physics by Halliday, Resnick and Walker	No (Available as an e-book)
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	ختر	70 - 79	Sound works with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	<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.