نموذج وصف البرنامج الأكاديمي

اسم الجامعة / جامعة واسط

كلية / معهد / كلية العلوم

القسم العلمي / قسم الفيزياء

اسم البرنامج الأكاديمي أو المهني

درجة البكالوريوس في العلوم (الفيزياء العامة / الفيزياء الطبية)

اسم الدرجة النهائية / بكالوريوس العلوم في الفيزياء/الفيزياء العامة / بكالوريوس العلوم في الفيزياء/ الفيزياء الطبية

الفصول الدراسية : بولونيا الصف الأول والصف الثاني النظام الأكاديمي :

الوصف تاريخ التحضير: 1/ 8 / 2025

تاريخ إكمال الملف : 1 / 9 /2025

التوقيع:

أ.م.د فراس محمد داشور

رئيس قسم الفيزياء

2025 / ٩ / ١

المعاون العلمي:

أ.م.د: علي جبار فريح

تم التحقق من الملف بواسطة :

قسم ضمان الجودة والأداء الجامعي

مدير إدارة ضمان الجودة والأداء الجامعي: أ.م.د حسين تقي جون

التاريخ : ٥/ ٩ / 2025 **التوقيع :** **موافقة العميد : أ.م.د فائق جميل حسن**

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**اللغة العربية**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☐**Lecture** ☐**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**WU01**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level		UGI	**Semester of Delivery**		one
Administering Department		WAR	**College**	science	
Module Leader	احمد عبد الحميد رسن		**e-mail**	Zainabd303@uowasit.edu.iq	
Module Leader's Acad. Title		مدرس	**Module Leader's Qualification**		PhD.
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date		2023-11-9	**Version Number**		1.0

Relation with other Modules العالقة مع المواد الدراسية أألخرى			
Prerequisite module	ال يوجد	**Semester**	ال يوجد
Co-requisites module	ال يوجد	**Semester**	ال يوجد

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1- المهارة اللغوية للطلبة و تمكينهم من التعبير عن أفكارهم و مشاريعهم باللغة العربية و بطالقة. Linguistic proficiency of students by enabling them to express their ideas and projects in fluent Arabic. 2- تجنب الطلبة التحدث باللغة الدارجة او الكلمات غير العربية Students avoid speaking in colloquial and non-Arabic language in the simplest ways. 3- كتابة التقارير و المقالات باللغة العربية و بشكل انسيابي و دقيق و منظم Writing reports and articles in fluent, concise and well-organized Arabic. 4- استخدام قواعد اللغة العربية بشكل صحيح الن اللغة هي الأداة الأساسية للتواصل بين افراد المجتمع. Use Arabic grammar correctly; Because language is the primary tool of communication between members of society. 5- قراءة و فهم النصوص الاكاديمي باللغة العربية. Reading and understanding academic texts in Arabic. 6- تطوير قابلية الطلبة على أداء المهام و تقديمها في الوقت المطلوب. Developing the student's ability to perform assignments and submit them on time.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	عند الانتهاء من هذا الفصل، سيكون الطالب قادرين على: 1- إجادة القراءة والكتابة والتحدث باللغة العربية. 2- استخدام اللغة العربية للتواصل بفعالية في الأوساط الأكاديمية والمهنية. 3- التعرف على التعبيرات اللغوية والأدبية. 4- إظهار فهم أهمية مهارات اللغة العربية للنجاح في الهندسة. 5- تطبيق مهارات التفكير النقدي وحل المشكلات في مواقف العالم الحقيقي. 6- يساهم في زيادة معرفة الطالب بكيفية إعداد التقارير العلمية. Upon completion of this course, students will be able to: 1- Demonstrate proficiency in reading, writing, and speaking to Arabic. 2- Use Arabic to communicate effectively in academic and professional settings 3- Gain an understanding of linguistic and literary expressions 4- Demonstrate an understanding of the importance of Arabic language skills for success in engineering 5- Apply critical thinking and problem-solving skills to real-world situations 6- It contributes to increasing students' knowledge of how to prepare scientific reports.

Indicative Contents المحتويات الإرشادية	القواعد (12 ساعة) الاملاء(8 ساعة) الادب(6 ساعة) مهارات عامة (4 ساعة)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• تقديم المحاضرات النظرية وتحديد المعلومات الأكثر أهمية من خلال استخلاص الكلمات المفتاحية والأفكار. • يتم منح الطالب فر ً ظإنتاج اللغة، وتلقي تعليقات مباشرة لتحسين مهاراتهم اللغوية. • Present theoretical lectures and determine the information that is most significant by extracting keywords and ideas. • Students are given opportunities to produce language, and receive direct feedback to improve their language skills.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**50**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	20%	3,5 7, and 11	All
	Assignments	0	0		
	Projects / Lab.	-	-		
	Report	2	20%	4, and10	All
Summative assessment	Midterm Exam	2hr	10%	9	1,2,3,6
	Final Exam	3hr	50%		All
Total assessment			100%		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	Grammar: Speech and what it consists of: the noun, the verb, and the letter. First: the verb and its parts, its signs, and the past tense. القواعد:- الكلام وما يتكون منه: الاسم، والفعل، والحرف. أوالً: الفعل وأجزاؤه، وعالماته، والفعل الماضي.
Week 2	Grammar: subject and the news, types of subject and its rulings, definition of the news and its types. القواعد: المبتدأ والخبر، أنواع المبتدأ وأحكامه، تعريف الخبر وأنواعه.
Week 3	Grammar: Inna and its sisters, the five verbs. القواعد: إن و أخواتها، الأفعال الخمسة.

Week 4	Grammar: Plural of the sound masculine and the attached to it. And introducing the sources of the Arabic language. .قواعد : جمع المذكر السالم والملحق به. التعريف بمصادر اللغة العربية.
Week 5	Grammar: the number قواعد: العدد.
Week 6	Grammar: the verbal sentence, the subject and its deputy القواعد: الجملة الفعلية والفاعل ونائبه
Week 7	Spelling: Rules for writing Hamza> الملاء: قواعد كتابة الهمزة
Week 8	Spelling: Common linguistic errors. And punctuation marks. الملاء: الأخطاء اللغوية الشائعة, وعالمات الترقيم
Week 9	Mid exam
Week 10	Spelling: The difference between ḍād, dha, sīn and sūf ..أملاء: الفرق بين الضاد والظاء والسين وسوف
Week 11	Spelling: The rules for writing an alif at the end of a word. الملاء: كتابة قواعد كتابة االلف في نهاية الكلمة
Week 12	Literature: The poet Badr Shaker Al-Sayyab, his life and collections, an analysis of the poem (Jikur and the City), and a reading and analysis of a prose text by Ibn Uyaynah the Sufi. الأدب: الشاعر بدر شاكر السياب, حياته ودواوينه, وتحليل قصيدة (جيكور والمدينة), وقراءة وتحليل نص نثري البن عينه الصوفي
Week 13	Literature: The poet Nazik Al-Malaika, her life and poetry, an analysis of the poem (Strangers) and a reading of the prose text of the sermon of the pious by Imam Ali - peace - be upon him الأدب: الشاعرة نازك الملائكة, حياتها ودواوينها, وتحليل قصيدة (غرباء) وقراءة نص نثري خطبة المتقين لإلمام علي - عليه السالم-

Week 14	Qur'anic texts, lessons in Islamic education, interpretation and rhetorical miracles. النصوص القرآنية دروس في التربية السالمية والتفسير والإعجاز البلاغي.
Week 15	Public lecture and discussions محاضرة و مناقشات عامة
Week 16	**Preparation for the final exam** التهيؤ لامتحان النهائي

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	لا يوجد
Week 2	لا يوجد
Week 3	لا يوجد
Week 4	لا يوجد
Week 5	لا يوجد
Week 6	لا يوجد
Week 7	لا يوجد

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Explanation of Ibn Aqeel on the Alfiyyah of Ibn Malik, edited by Muhyiddin Abdul Hamid شرح ابن عقيل على ألفية ابن مالك، تحقيق محيي الدين عبد الحميد.	
Recommended Texts	Arabic language for non-specialization departments اللغة العربية للقسام غير المختصة	
Websites		

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	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.

جدول الساعات المجدولة وغير المجدولة لمادة

Arabic Language

نوع النشاط	الساعات المجدولة SSWL	الساعات غير المجدولة USSWL	عدد الأسابيع	ساعة لكل أسبوع	العبء الكلي للنشاط
محاضرات	محاضرات في القاعات الدراسية		15	2	20
المختبر	دوام المختبر		0	0	0
مناقشات*	المناقشات		0	0	0
مشروع عملي*	مشروع عملي		0	0	0
		التهيئة للمشروع	0	0	0
تحضير الدروس اليومي		تحضير الدروس اليومي	10	1	10
العروض التقديمية*	القاء العرض التقديمي		0	0	0
		التهيئة للعرض التقديمي	1	1	1
الامتحانات اليومية	الامتحان		0	0	0

		التهيئة للامتحانات اليومية	4	1	4
امتحان نصف الفصل	الامتحان		0	0	0
		التهيئة لامتحان	1	2	2
امتحان نهاية الفصل	الامتحان		1	3	3
		التهيئة لامتحان	1	2	2
			العبء الكلي للمادة خلال الفصل:		50
			عدد الوحدات:		2
*ال توجد ساعات مجدولة لهذه النشاطات كون تم استيفاؤها ضمن الصفوف الدراسية.					

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Computer programing**			**Module Delivery**	
Module Type	Basic			☒**Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	WUO3				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level		UGI	**Semester of Delivery**		One
Administering Department		WAR	**College**	College of science	
Module Leader	Mohammed Jaber Mohammed		**e-mail**	Mohammed900 @uowasit.edu.iq	
Module Leader's Acad. Title		A. Lecturer	**Module Leader's Qualification**		M.Sc
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date		21-6-2023	**Version Number**		1.0

Relation with other Modules العالقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	None
Co-requisites module	None	**Semester**	None

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Giving the student a general idea of computer programing at a study environment, library, and at home. 2. Understanding the basic rules for dealing with and managing programming languages (MATLAB programing language). . 3. introducing the student to simulating physical phenomenas with Matlab programing
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. knowledge of the different programing languages. 2. The ability to write program codes with MATLAB. 3. Understand the basics of computer programing. 4. The ability to use computer programing and specifically MATLAB to process physical data. 5. The ability to use MATLAB to plot and graph physical data.
Indicative Contents المحتويات الإرشادية	Part A (12 hr)\ Introduction to programing languages and the fundamentals of MATLAB Part B (16 hr) Loops and logic in MATLAB Part C (12 hr) Grids and plots in multiple dimensions Part D (16 hr) Solving equations with MATLAB

Learning and Teaching Strategies استراجيات التعلم والتعليم	
Strategies	1. Using computers and display screens to explain lectures to students to increase students' mental comprehension. 2. Practical applications in the computer lab of what was explained in the theoretical lecture. 3. Using direct questions in the classroom as brainstorming skills. 4. Encouraging students to solve class and homework assignments and to perform specialized reports.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي الغير منتظم للطالب خلال الفصل	27	**Unstructured SWL (h/w)** الحمل الدراسي الغير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**75**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	3	9 % (9)	3, 12	All
	Assignments	3	6 % (6)	6, 11	All
	Lab.	15	15% (15)	Continuous	All
	Projects	2	10%	7, 15	/
Summative assessment	**Midterm Exam**	2hr	10% (10)	9	All
	Final Exam	3hr	50% (50)	16	All
Total assessment			100		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	• Part1: Chapter One: Fundamentals of programing languages and MATLAB.
Week 2	• Part1: Chapter Two: Essential commands, scripts, matrix representations
Week 3	• Part1: Chapter Three: Debugging codes and simple programs codes + Quiz 1
Week 4	• Part2: Chapter One: Loops in MATLAB and summing a series with a for loop
Week 5	• Part2: Chapter Two: mathematical procedures with the for loops
Week 6	• Part2: Chapter Three: logic and the if statements + assignment
Week 7	• Part2: Chapter Four: Simple programs using the if and for loops + while loops+ project
Week 8	**Midterm Exam**
Week 9	• Part3: Chapter one: introduction to grids and plots + linear plotting
Week 10	• Part3: Chapter two: plotting functions + plot appearance
Week 11	• Part3: Chapter three: Multiple plots + common functions plots+ writing plotting codes+ assignment
Week 12	• Part4: Chapter One: Linear and systems of nonlinear equations in MATLAB + Quiz 2
Week 13	• Part4: Chapter Two: Introduction to derivatives and integrals with MATLAB
Week 14	• Part4: Chapter Three: Introduction to solving ODEs in MATLAB
Week 15	• Part4: Chapter Four: Solving ODEs numerically in MATLAB +MATLAB DEs solvers + project
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	• Part1: Chapter One: Fundamentals of programing languages and MATLAB.
Week 2	• Part1: Chapter Two: Essential commands, scripts, matrix representations
Week 3	• Part1: Chapter Three: Debugging codes and simple programs codes
Week 4	• Part2: Chapter One: Loops in MATLAB and summing a series with a for loop
Week 5	• Part2: Chapter Two: mathematical procedures with the for loops
Week 6	• Part2: Chapter Three: logic and the if statements
Week 7	• Part2: Chapter Four: Simple programs using the if and for loops + while loops
Week 8	• Project demonstration and application
Week 9	• Part3: Chapter one: introduction to grids and plots + linear plotting
Week 10	• Part3: Chapter two: plotting functions + plot appearance
Week 11	• Part3: Chapter three: Multiple plots + common functions plots+ writing plotting codes
Week 12	• Part4: Chapter One: Linear and systems of nonlinear equations in MATLAB
Week 13	• Part4: Chapter Two: Introduction to derivatives and integrals with MATLAB
Week 14	• Part4: Chapter Three: Introduction to solving ODEs in MATLAB
Week 15	• Part4: Chapter Four: Solving ODEs numerically in MATLAB +MATLAB DEs solvers
Week 16	**Final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Ross L. Spencer, Introduction to MATLAB	yes
Recommended Texts	Ross L. Spencer, Introduction to MATLAB	yes
Websites		

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	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Fundamentals of Computer Science**			**Module Delivery**	
Module Type	Basic			☒**Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	WUO3				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level		UGI	**Semester of Delivery**		One
Administering Department		WAR	**College**	College of science	
Module Leader	Ilyas khudhair yaluai		**e-mail**	Ilyas @uowasit.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		PH.D
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date		25-6-2023	**Version Number**		1.0

Relation with other Modules العالقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	None
Co-requisites module	None	**Semester**	None

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Giving the student a general idea of computer material at a study environment, library, and at home. 2. Understanding the basic rules for dealing with and managing computers (computer basics, computer components, computer and software licenses, operating systems,), With the aim of preparing the student to enter the programs he needs in the department. 3. Giving the student knowledge about the office applications as basic principles for students in the College of Engineering.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowing computer peripherals, their connections and Windows system. 2. Distinguish between the important tabs in the Word program. 3. The ability to write an entire paragraph with formatting. 4. Understand the basics of power point program. 5. Understand the excel sheet program.
Indicative Contents المحتويات الإرشادية	Part A (9 hr) Introduction to computer principles. Part B (12 hr) MS Word program. Part C (12 hr) MS Excel program. Part D (12 hr) MS Power Point program.

Learning and Teaching Strategies استراجيات التعلم والتعليم	
Strategies	1. Using computers and display screens to explain lectures to students to increase students' mental comprehension. 2. Practical applications in the computer lab of what was explained in the theoretical lecture. 3. Using direct questions in the classroom as brainstorming skills. 4. Encouraging students to solve class and homework assignments and to perform specialized reports.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي الغير منتظم للطالب خلال الفصل	27	**Unstructured SWL (h/w)** الحمل الدراسي الغير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**75**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	3	15% (15)	4, 8, 12	All
	Assignments	1	5% (5)	10	All
	Lab.	15	15% (15)	Continuous	All
	Projects	1	5%	13	/
Summative assessment	**Midterm Exam**	2hr	10% (10)	9	All
	Final Exam	3hr	50% (50)	16	All
Total assessment			100		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	• Part1: Chapter One: Computer Fundamentals, Computer Components.
Week 2	• Part1: Chapter Two: Computer Safety and software Licenses.
Week 3	• Part1: Chapter Three: Main operating systems
Week 4	• Part2: Chapter One: Introduction to Microsoft word + Quizzes1
Week 5	• Part2: Chapter Two: Insert Objects to Microsoft word, Editing Documents
Week 6	• Part2: Chapter Three: writing the equations
Week 7	• Part2: Chapter Four: Formatting Pages
Week 8	• Part3: Chapter One: Introduction to Microsoft Excel+ Quizzes2
Week 9	• Part3: Chapter Two: Additional Tasks in Microsoft word+ Midterm Exam
Week 10	• Part3: Chapter Three: Additional Tasks in Microsoft word+ Assignments
Week 11	• Part3: Chapter Four: Additional Tasks in Microsoft word
Week 12	• Part4: Chapter One: Introduction to Power Point+ Quizzes3
Week 13	• Part4: Chapter Two: Insert Objects and Add Animations in Microsoft Power Point+ Project
Week 14	• Part4: Chapter Three: Additional Tasks in Microsoft Excel Cont.
Week 15	• Part4: Chapter Four: Additional Tasks in Microsoft Excel Cont.
Week 16	• Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	• Part1: Chapter One: Computer Fundamentals, Computer Components.
Week 2	• Part1: Chapter Two: Computer Safety and software Licenses.
Week 3	• Part1: Chapter Three: Main operating systems
Week 4	• Part2: Chapter One: Introduction to Microsoft word
Week 5	• Part2: Chapter Two: Insert Objects to Microsoft word, Editing Documents
Week 6	• Part2: Chapter Three: writing the equations
Week 7	• Part2: Chapter Four: Formatting Pages
Week 8	• Part3: Chapter One: Introduction to Microsoft Excel
Week 9	• Part3: Chapter Two: Additional Tasks in Microsoft word
Week 10	• Part3: Chapter Three: Additional Tasks in Microsoft word
Week 11	• Part3: Chapter Four: Additional Tasks in Microsoft word
Week 12	• Part4: Chapter One: Introduction to Power Point
Week 13	• Part4: Chapter Two: Insert Objects and Add Animations in Microsoft Power Point
Week 14	• Part4: Chapter Three: Additional Tasks in Microsoft Excel.
Week 15	• Part4: Chapter Four: Additional Tasks in Microsoft Excel.
Week 16	• Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	اساسات الحاسوب وتطبيقاته المكتبية	نعم
Recommended Texts		
Websites	https://www.tutorialspoint.com/word/word_move_text.htm	

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	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.

جدول الساعات المجدولة وغير المجدولة لمادة

Computer Skills

نوع النشاط	اعات المجدولة SSWL	الساعات غ ريالمجدولة USSWL	عدد ألسابيع	ساعة لكل أسبوع	العبء الك لي للنشاط
محاضرات	محاضرات في القاعات الدراسية		15	1	15
المختبر	دوام المختبر		15	2	30
مناقشات	المناقشات		0	0	0
مشروع عملي	مشروع عمل		0	0	0
		التهيئة للمشروع	0	0	0
انجاز الواجب البيتي		تحضرت المشاريع البيتية	3	1	3
العروض التقديمية	القاء العرض التقديم		0	0	0
		التهيئة للعرض التقديم	0	0	0
الامتحانات اليومية		التهيئة للامتحانات اليومية	3	2	6
امتحان نصف الفصل	الامتحان		0	0	0
		التهيئة للامتحان	1	6	6
امتحان نهاية الفصل	الامتحان		1	3	3
		التهيئة للامتحان	1	12	12
			العبء الك إللمادة خلال الفصل:		75
			عدد الوحدات:		3

*ال توجد ساعات مجدولة لهذه النشاطات كون تم استيفاؤها ضمن الصفوف الدراسية.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Mathematics II**			**Module Delivery**	
Module Type	**Core**			**Theory** **Lecture** ☐ **Lab** ☒ **Tutorial** **Practical** **Seminar**	
Module Code	**PHY-123**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	UGx11	1	**Semester of Delivery**		1
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Name Najwa Jassim Jubier		**e-mail**	E-mail njassim@uowasit.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		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	
Module Aims أهداف المادة الدراسية	1. Mathematics is a fundamental part of human thought and logic, and integral to attempts at understanding the world and ourselves. 2. Mathematics provides an effective way of building mental discipline and encourages logical reasoning and mental rigor. 3. In addition, mathematical knowledge plays a crucial role in understanding the contents of other subjects such as the science of physics. 4. Providing learners with knowledge of the importance of mathematics in the field of physics 5. Developing positive attitudes regarding this knowledge of mathematical equations and methods that are useful to physicists in a theoretical way. 6. Learn about types of integration and their methods. 7. Recognizing the basic concepts of mathematics. 8. Identify the stages of development of mathematics and the importance of mathematical transformations and their future use in physics 9. As well as introducing students to the integral of functions and their applications in physics. 11. Introducing students to the integration of functions, their methods, and applications 12. Introducing students to sequences and series.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**1. Integrate the domain of concepts and knowledge from mathematics into the practical application of physics phenomena, and the development of abilities and skills to solve example problems.** **2. Know the methods of the integral of functions.** **3. Identify the type of equations used in physical measuring devices** **4. Comparison between mathematics and physics in terms of laws, use, and usefulness.**

	5. **Learn about basic mathematical methods and study the methods of integration and their applications** 6. **Identifying mathematical functions and algebra and linking their importance to physicists.** 7. **Analyze the results mathematically.**
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A – Differentiation of Hyperbolic Functions Inverse trigonometric Functions and Their Derivatives Integral, The Idea of the Integral, definite integrals, Properties of definite integrals, Integral of Exponential and Logarithmic Functions, Integral of the Trigonometric functions. Integration of Hyperbolic Functions ,Integration of inverse trigonometric Functions Part B – Techniques of Integration Integration by Parts, Trigonometric Integrals, Trigonometric Substitutions Partial Fractions. Improper Integrals, Applications of the Integral(Areas and Volumes) Vectors Vectors in the Plane, Definitions and Laws of Vector Algebra, equation of the straight line in space Sequences and series definition of sequence, infinite series, Geometric series, common Convergence Tests - Comparison Test , Integral, The Taylor Series for e^x, sin x, and cos x Power Series ratio of the nth root. Revision problem classes

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 محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

As

Module Evaluation تقييم المادة الدراسية					
		Time/ Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7

	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction, Differentiation of Hyperbolic Functions
Week 2	Inverse trigonometric Functions and Their Derivatives
Week 3	Integral, The idea of the Integral, definite integrals, Properties of definite integrals, , Indefinite integrals
Week 4	Integral of Exponential and Logarithmic Functions and other functions
Week 5	Integral of the Trigonometric functions
Week 6	Integration of Hyperbolic Functions
Week 7	Integration of inverse trigonometric Functions
Week 8	Mid-term Exam
Week 9	Techniques of Integration
Week 10	Integration by Parts, Trigonometric Integrals, Trigonometric Substitutions
Week 11	Vectors Vectors in the Plane, Definitions and Laws of Vector Algebra, equation of the straight line in space
Week 12	Sequences and series, definition of sequence, infinite series
Week 13	Geometric series, common Convergence Tests - Comparison Test

Week 14	Integral, ratio of the nth root ,The Taylor Series for e^x, sin x, and cos x,Power Series
Week 15	review
Week 16	The preparatory week before the Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	Lab 1:
Week 2	Lab 2:
Week 3	Lab 3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**Calculus and Analytic Geometer/Thomson**	Yes
Recommended Texts	**Calculus and its applications Marvin L. Bittinger** **David J. Ellenbogen,Scott A. Surgent, Tenth EditionL 2012**	No
Websites		

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	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.

المفردات الدراسية

اسم المادة	باللغة العربية	اللغة الانكليزية	السنة الدراسية	عدد الساعات الدراسية			
	باللغة الإنكليزية	English Language	الأولى	النظرية	العملية	المجموع	عدد الوحدات
لغة تدريس المادة		English		٢	–	٢	2

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Lecture no.	Topics
1-2	Cardinal numbers/years/prices/times (in words and figures).
	Phonetic of alphabet letters, Punctuation.
	Countries/Capitals, arrange words (makes full sentence)/ arrange letters (makefull word).
	Simple present/1. Verb to be (is/am/are) (affirmative, negativeand interrogative).
3-4	Simple present/2. Verb to do (Do/Does) (affirmative, negative andinterrogative).
	Simple present/3. Verb to have (have/has) (affirmative, negativeand interrogative).
	Simple present/4. Ordinary verbs like (eat, go, play… etc.)(affirmative, negative and interrogative)
	Tag questions and short answers (yes/no questions).
5-6	Review (Simple present).
	Question words (what, where, when, who, why, how, whom,whose, which).
	Abbreviation (short form), adjectives (and their opposite).
	Plural nouns (regular and irregular).
7-8	Possession (all types).
	Pronunciation (-s at the end of a word).
	Pronouns (all types).
	This/that, there is/there are (affirmative, negative and interrogative - question words).
9-10	Preposition (on, in, at, of, to, with, for, under, next to).
	Some and any.

	Simple past (Verb to be – was/were) (affirmative, negative andinterrogative- Tag questions/question words).
11	Simple past (regular verbs) (affirmative, negative and interrogative- Tag questions/question words).
	Simple past (irregular verbs)/ (affirmative, negative andinterrogative- Tag questions/question words).
	Review (Simple past).
12	Pronunciation of (/t/, /d/, Id/).
	Can (affirmative, negative and interrogative- Tag questions/question words).
13	Would like (affirmative, and interrogative), Like and would like.
	Colors and clothes.
14	Present continuous (affirmative, negative and interrogative- Tagquestions/question words).
	Review (Present continuous).
	Future plans (affirmative, interrogative- /question words).
15	Review (Future plans).

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Mathematics II**			**Module Delivery**	
Module Type	**Core**			**Theory** **Lecture** ☐ **Lab** ☒ **Tutorial** **Practical** **Seminar**	
Module Code	**PHY-123**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	UGx11	1	**Semester of Delivery**		1
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Name Najwa Jassim Jubier		**e-mail**	E-mail njassim@uowasit.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		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	
Module Aims أهداف المادة الدراسية	1. Mathematics is a fundamental part of human thought and logic, and integral to attempts at understanding the world and ourselves. 2. Mathematics provides an effective way of building mental discipline and encourages logical reasoning and mental rigor. 3. In addition, mathematical knowledge plays a crucial role in understanding the contents of other subjects such as the science of physics. 4. Providing learners with knowledge of the importance of mathematics in the field of physics 5. Developing positive attitudes regarding this knowledge of mathematical equations and methods that are useful to physicists in a theoretical way. 6. Learn about types of integration and their methods. 7. Recognizing the basic concepts of mathematics. 8. Identify the stages of development of mathematics and the importance of mathematical transformations and their future use in physics 9. As well as introducing students to the integral of functions and their applications in physics. 11. Introducing students to the integration of functions, their methods, and applications 12. Introducing students to sequences and series.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**1. Integrate the domain of concepts and knowledge from mathematics into the practical application of physics phenomena, and the development of abilities and skills to solve example problems.** **2. Know the methods of the integral of functions.** **3. Identify the type of equations used in physical measuring devices** **4. Comparison between mathematics and physics in terms of laws, use, and usefulness.**

	5. **Learn about basic mathematical methods and study the methods of integration and their applications** 6. **Identifying mathematical functions and algebra and linking their importance to physicists.** 7. **Analyze the results mathematically.**
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A – Differentiation of Hyperbolic Functions Inverse trigonometric Functions and Their Derivatives Integral, The Idea of the Integral, definite integrals, Properties of definite integrals, Integral of Exponential and Logarithmic Functions, Integral of the Trigonometric functions. Integration of Hyperbolic Functions ,Integration of inverse trigonometric Functions Part B – Techniques of Integration Integration by Parts, Trigonometric Integrals, Trigonometric Substitutions Partial Fractions. Improper Integrals, Applications of the Integral(Areas and Volumes) Vectors Vectors in the Plane, Definitions and Laws of Vector Algebra, equation of the straight line in space Sequences and series definition of sequence, infinite series, Geometric series, common Convergence Tests - Comparison Test , Integral, The Taylor Series for e^x, sin x, and cos x Power Series ratio of the nth root. Revision problem classes

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 محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

As

Module Evaluation تقييم المادة الدراسية					
		Time/ Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7

	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction, Differentiation of Hyperbolic Functions
Week 2	Inverse trigonometric Functions and Their Derivatives
Week 3	Integral, The idea of the Integral, definite integrals, Properties of definite integrals, , Indefinite integrals
Week 4	Integral of Exponential and Logarithmic Functions and other functions
Week 5	Integral of the Trigonometric functions
Week 6	Integration of Hyperbolic Functions
Week 7	Integration of inverse trigonometric Functions
Week 8	Mid-term Exam
Week 9	Techniques of Integration
Week 10	Integration by Parts, Trigonometric Integrals, Trigonometric Substitutions
Week 11	Vectors Vectors in the Plane, Definitions and Laws of Vector Algebra, equation of the straight line in space
Week 12	Sequences and series, definition of sequence, infinite series
Week 13	Geometric series, common Convergence Tests - Comparison Test

Week 14	Integral, ratio of the nth root ,The Taylor Series for e^x, sin x, and cos x,Power Series
Week 15	review
Week 16	The preparatory week before the Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	Lab 1:
Week 2	Lab 2:
Week 3	Lab 3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**Calculus and Analytic Geometer/Thomson**	Yes
Recommended Texts	**Calculus and its applications Marvin L. Bittinger** **David J. Ellenbogen,Scott A. Surgent, Tenth EditionL 2012**	No
Websites		

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Magnetism**			**Module Delivery**	
Module Type	**Core learning activity**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**Phys 1215**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Asst.Prof.Dr. Ghada Ayad Kadhim		**e-mail**	gayad@uowasit.edu.iq	
Module Leader's Acad. Title	Assistant Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	------		**e-mail**	------	
Peer Reviewer Name	-------		**e-mail**	-------	
Scientific Committee Approval Date	21/06/2023		**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	
Module Aims أهداف المادة الدراسية	1. Enable the student to know the basics of magnetism. 2. The student's knowledge of magnetic poles and the forces that deal with them. 3. Enable the student to analyze electrical circuits and the basic elements of the coiled and capacitance circuit. 4. Analyzing electrical circuits mathematically. 5. Practical application of theoretical material in the laboratory.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	After completing the Semester, the student will be able to: 1. Know what are magnets and magnetic force. 2. Know the laws of static magnetic field and use them to solve problems and related applications. 3. Know Lorenz's law and how to determine the vector of force, velocity and current. 4. Explain and calculate the results of applying magnetic fields to magnetizable materials such as restricted current magnetic field inside the material. 5. Uses computer software to simulate a specific magnetic phenomenon 6. Demonstrates the ability to learn continuously and works alone or in a team
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - Theoretical basis of Magnetism</u> What is the magnet, magnetic poles and its different forms, the emergence of magnetic lines and knowledge of its characteristics. [13 hrs] Explain the magnetic field and determining the direction of the magnetic force in relation to the velocity and the direction of the field according to the rule of the left and right hands, depending on the type of charge entering the magnetic field. [15 hrs] Deriving the magnetic force and its theoretical basis and explain Faraday’s law with examples and exercises. [10 hrs] Explain the most important applications that include magnetic and electric forces, as in the velocity selector device and the mass spectrometer. [13 hrs] Explain the capacitance and resistance circuits and the derivation of charge and current in the case of charging and discharging. [10 hrs] <u>Part B – electromagnetism</u> Know the most important concepts of Maxwell's theory. [10 hrs] Explain the electric field, the magnetic field, and the derivation of the velocity of electromagnetic waves. [15 hrs]

	Deriving the intensity of electromagnetic waves and explaining their theoretical basis. [12 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. 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. 2. Make the student able to use the devices in the electrical laboratory and carry out experiments. 3.The student should be able to prepare reports on laboratory experiments and discuss the results.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	94	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	81	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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**	2	10% (10)	5, 10	----------
	Assignments	2	5% (5)	2, 12	----------

	Projects / Lab.	1	10% (10)	Continuous	----------
	Report	1	5% (5)	13	----------
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	----------
	Final Exam	2hr	60% (60)	16	----------
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Magnetism
Week 2	Magnetic Field Lines
Week 3	Magnetic Flux Density
Week 4	Origin of Magnetic Fields
Week 5	Magnetic Force on Moving Charge
Week 6	Direction of Magnetic Force
Week 7	Exam
Week 8	Forces on Negative Charges
Week 9	The Velocity Selector
Week 10	Mass Spectrometer
Week 11	Application of Faraday's Law
Week 12	Energy Density
Week 13	RC Circuit
Week 14	Maxwell's Theory
Week 15	Electro magmatic wave Intensity and Distance
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: **capacitors Connect series and parallel**
Week 2	Lab 2: **Calculate the potential difference and the total charge of the circuit**
Week 3	Lab 3: **The internal resistance of the ammeter**

Week 4	Lab 4: **CRO cathode oscilloscope**
Week 5	Lab 5 **Achieve Stefan's law of radiation**
Week 6	Lab 6:**Research the relationship between the current passing through a tungsten filament and the voltage applied to it**
Week 7	Lab 7: **Study the(current-voltage) characteristics of diode**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Electricity and Magnetism 3rd Edition by Edward M. Purcell	Yes
Recommended Texts	Electromagnetic waves and Transmission Lines by R.S.Rao..	No
Websites	https://byjus.com/physics/electricity-and-magnetism/	

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	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	General Astronomy			**Module Delivery**	
Module Type	Core			**Theory**	
Module Code	Phys 1103			**Lecture**	
ECTS Credits	4			**Lab**	
SWL (hr/sem)	80			**Tutorial** **Practical** **Seminar**	
Module Level	UGx11	1	**Semester of Delivery**		1
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Khudhair Abbas Assaf		**e-mail**	kassaf@uowasit.edu.iq	
Module Leader's Acad. Title		Assist Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date		21/06/2023	**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	
Module Aims أهداف المادة الدراسية	1. To develop problem solving skills and understanding of general astronomy 2. To understand spherical geometry. 3. This course deals determining the position of the celestial objects. 4. To study the physical properties of the Sun and Moon . 5. Studying the properties of the solar system. 6. To study the Milky Way and other galaxies.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understanding the geometry of spherical triangles. 2. Understanding how to use astronomical coordinate system to determine the position of objects in the sky. 3. Summarize the astronomical units. 4. Describe the solar system. 5. Understanding some of the physical properties of the Sun and Moon. 6. Define Bude low. 7. Understanding the properties of stars. 8. Discuss the evolution of star. 9. Discuss type of stars. 10. Explain the type of galaxies.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – General Astronomy</u> General astronomy- Kepler's laws. The geometry of sphere. Celestial sphere . Defining

	some spherical terms. Defining some astronomical parameters. Studying some mathematical forms. Astronomical coordinate systems. Transformation of one coordinate system into another [24 hrs] The Sun, studying some physical properties of the sun. The Moon . explain some physical properties of the moon, the periods of the Moon. The planets. Studying the physics of eight planets. Bude low, the origin of the solar system.[20 hrs] Revision problem classes [6 hrs] <u>Part B –Stars and Galaxies</u> Understanding the stellar magnitude. Brightness. Luminosity. Some physical properties of stars. Movement of star. Classification of star. Understanding of stellar evolution. life time of star. HR- diagram [20 hrs] Type of stars. Classification of stars. Determining of some physical properties of stars. Binary and Multiple Star Systems . Variable stars [16 hrs] Galaxies. Type of galaxies . the component of our galaxy the milky Way[8 hrs] Revision problem classes [6 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	45	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	35	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	80		

As

Module Evaluation تقييم المادة الدراسية					
		Time/ Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	3	10% (10)	4, 7,10	LO #1, 2, 10 and 11
	presentation	1	10% (10)	12	LO # 3, 4, 6 and 7
	Projects / Lab.	0	0% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO # 1-7
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Kepler's laws
Week 2	Spherical Geometry and Spherical trigonometry
Week 3	Celestial sphere
Week 4	Coordinate systems
Week 5	Transformation of one coordinate system into another
Week 6	The astronomical units
Week 7	The Sun
Week 8	The Moon
Week 9	Stellar magnitude
Week 10	Stellar Motion and Stellar distance
Week 11	Hertzsprung - Russell diagram
Week 12	Stellar Evolution
Week 13	Binary and Multiple Star Systems
Week 14	Variable stars
Week 15	Galaxies and Our galaxy (Milky Way)
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**

Required Texts	فيزياء الجو والفضاء : الجزء الاول (علم الفلك) – حميد مجول النعيمي وفياض النجم	Yes
Recommended Texts	Astronomy: Principle and Practice A.E. Roy, D. Clarke	No
Websites		

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	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Properties of Matter			**Module Delivery**	
Module Type	Core			**Theory**	
Module Code	???? Phys			**Lecture**	
ECTS Credits	7			**Lab**	
SWL (hr/sem)	125			**Tutorial** **Practical** **Seminar**	
Module Level	UGx11	1	**Semester of Delivery**		1
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Khudhair Abbas Assaf		**e-mail**	kassaf@uowasit.edu.iq	
Module Leader's Acad. Title		Assist Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date		21/06/2023	**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	
Module Aims أهداف المادة الدراسية	1. To develop problem solving skills and understanding the properties of matter 2. To understand Elasticity. 3. This course deals Fluid at rest 4. To deal with pressure in fluid of uniform density and varies density 5. To understand Buoyancy, Continuity Equation and Bernoulli Equation. 6. To analysis Traveling waves and Standing waves .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Dealing with type of stress and strain. 2. Studying the Atmospheric pressure and Gauge pressure . 3. Understanding the Pascal law, Archimedes' principle and surface tension 4. Dealing with The Continuity Equation in confined fluids 5. Understanding the interference between waves
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A -</u> Elasticity, direct stress, direct strain, Modulus of elasticity, ultimate tensile stress, shear stress and strain, ultimate shear stress, Modulus of rigidity and double shear [10 hrs] Fluid mechanics, pressure, Variation of pressure with depth in a fluid of constant density, Pressure at a Depth for a Fluid of Constant Density, Atmospheric Pressure, Variation of atmospheric pressure with height and Pascal law [10 hrs]

	Revision problem classes [6 hrs] Part B - Surface tension, Capillarity, Capillary Action, Capillary Pressure . [6 hrs] The density, Buoyancy, Archimedes' principle, Fluid Flow, Continuity equation, Bernoulli Equation [8 hrs] Traveling waves, interference waves, Standing waves [8 hrs] Revision problem classes [4 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	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 محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	90	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	35	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

As

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week

	Material Covered
Week 1	Direct Stress- strain
Week 2	Modulus of rigidity and double shear
Week 3	shear stress and strain

Week 4	Fluid Mechanics
Week 5	Atmospheric and gauge pressure
Week 6	Variation of atmospheric pressure with height and Pascal law
Week 7	Fluid flow
Week 8	**Midterm exam**
Week 9	Surface Tension
Week 10	Capillary action
Week 11	Buoyancy
Week 12	Archimedes' Law
Week 13	Traveling waves
Week 14	interference waves
Week 15	Standing waves
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	Lab 1: Measurement of Viscosity of a Liquid by Stokes Law
Week 2	Lab 2: Measurement the coefficient of surface tension of liquid by capillary tube
Week 3	Lab 3: Measurement the density of liquid
Week 4	Lab 4: The balance of power
Week 5	Lab 5: Spin radius of a cylinder rolling down on an inclined surface
Week 6	Lab 6: Determine the surface tension of a given liquid Using stalagmometer by drop number method
Week 7	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		Yes
Recommended Texts	Classical mechanics John r. Taylor	No
Websites		

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	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.

MODULE DESCRIPTION
وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Mathematics I**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**PHY-113**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	physics		**College**	Sciences	
Module Leader	Najwa Jassim Jubier Abbas		**e-mail**	njassim@uowasit.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee ApprovalDate	01/06/2023		**Version Number**	1.0	

Relation with other Modules العالقة 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 اهداف المادة الدراسية	1. This course deals with the basic scalar or dot product, vector or cross product, triple scalar product and triple vector product 2. To describe types of functions 3. To understand exponential functions and logarithmic functions 4. To distinguish partial derivatives and implicit derivation 5. To solve trigonometric functions inverse and trigonometric functions 6. To application chain rule
Module Learning Outcomes مخرجات التعلم المادة الدراسية	1. Recognize scalar or dot product, vector or cross product 2. Recognize Type of function. 3. Discuss the derivative of special functions 4. Summarize what is meant by a basic Implicit derivation 5. understand trigonometric functions 6. know Exponential functions 7. Define logarithmic functions 8. Identify the basic trigonometric, exponential and logarithmic functions and their applications. 9. Discuss the derivative of a function in more than two variables 10. employment chain rule
Indicative Contents المحتويات الارشادية	Indicative content includes the following. Part A - Fundamentals vector, functions, limits and continuity, Derivation, chain rule, Implicit derivation and Derivative of special functions and Trigonometric functions [14 hrs] inverse trigonometric functions, Exponential functions, Logarithmic functions Partial Derivatives [14 hrs] Revision problem classes [3hrs] Part B – application Scalar or Dot Product, Vector or Cross Product, Triple Scalar Product and TripleVector Product [13 hrs] Partial Derivatives and derivative of a function in two variables The derivative of a function in more than two variables. [13 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, using concepts in math vocabulary, meaningful and frequent homework to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills.

Student Workload (SWL) الحمل الدراسي للطالب محسوب ل 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي الغير منتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** ال الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	8, 12	LO #1, 2,3 , 4 5,6,7,and 8
	Assignments	2	10% (10)	2, 12	LO # 9, 10, 11 and 12
	Projects / Lab.	0	0% (10)	Continuous	All
	Report	2	20% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	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 Vectors And The Geometry Of Space
Week 2	Scalar Or Dot Product , Vector Or Cross Product , Triple Scalar Product And Triple Vector Product
Week 3	Functions, Types Of Functions (And Its Statement)
Week 4	The Limits And Continuity
Week 5	Derivation
Week 6	Derivative Of Special Functions
Week 7	Midterm Exam

Week 8	Implicit Derivation
Week 9	Chain Rule
Week 10	Trigonometric Functions
Week 11	Inverse Trigonometric Functions
Week 12	Exponential Functions And Logarithmic Functions
Week 13	Partial Derivatives
Week 14	Derivative Of A Function In Two Variables
Week 15	The Derivative Of A Function In More Than Two Variables
Week 16	**Preparatory Week Before The Final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Calculus and analytic Geometry by Thomas	Yes
Recommended Texts	University Calculus with Analytic Geometry	No
Websites	https://www.wolframalpha.com/	

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	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.

MODULE DESCRIPTION
وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Mechanics I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**PHY-111**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Physics		**College**	Science	
Module Leader	Khudhair Abbas Assaf		**e-mail**	kassaf@uowasit.edu.iq	
Module Leader's Acad. Title	Ass. Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee ApprovalDate	01/06/2023		**Version Number**	1.0	

Relation with other Modules العالقة 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	1. Provides a foundation for understanding the basic laws of motion, forces, and energy that govern the behavior of particles. 2. Develop students' skills in describing the position, velocity, acceleration, etc. of particles using vectors. 3. Developing problem-solving skills: by learning how to apply mathematicalmethods to solve problems related to the motion of particles. 4. Be able to build a mathematical model that describes a particle motion or the force that acting on it. 5. Developing an intuitive understanding of how particles move and interact with each other. 6. Provides the necessary base for further studies in physics such as electromagnetism, quantum mechanics, optics, thermodynamics, etc.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize difference between essential and drive units and how to use chain-link conversion. 2. Must be understanding the equations that describe the motion of a particle with constant acceleration. 3. Explain the difference between scalar and vector quantities and how add, subtract, and multiply vectors by components. 4. Describe the positon, displacement, velocity and acceleration of a particle by vectors. 5. Understanding the difference between moving and rest frames 6. How to express the positon, displacement, velocity and acceleration of a particle in moving and rest frame? 7. Recognize there are different types of forces, such as describe by positon, time and velocity etc. 8. Understanding the newton’s laws. 9. Recognize between kinetic energy and potential energy and difference between work and kinetic energy. 10. Explain the conserving force and how recognize between conserving and non- conserving force.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Measurement: the base quantities in the SI system, length, time, and mass. [6 hr] Motion along a straight line: position, displacement, acceleration, average velocity, constant acceleration. [10 hr] Vectors: vectors components, unit vectors, adding and subtracting, cross and dot

	products, triple product. [10 hr] Motion in two and three dimensions: position, displacement, average velocity, instantaneous velocity, acceleration, uniform circular motion and projectile. [10 hr] Relative motion: relative motion in one dimension, inertial force and relative motionin three dimension. [10 hr] Newton's laws: force, Newton's first law, Newton's second law and Newton's third law, some particular forces, some particular forces, friction and terminal speed. [10 hr] Kinetic energy and Work: Kinetic energy, work, work of gravitational force, work of a spring force, work of gravitational force, work of a spring force, work of a general variable Force and power. [15 hr] Potential energy: Work and potential energy, conservation of mechanical energy and reading a potential energy curve, work done on a system by an external Force conservation of energy [15 hr]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This is done through giving lectures and solving exercises, in addition to holding panel discussions and conducting practical experiments in the laboratory, in addition to the work of some computer simulation and modeling programs for some applied examples.

Student Workload (SWL) الحمل الدراسي للطالب محسوب ل ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	94	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي الغير منتظم للطالب خلال الفصل	81	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	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**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	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 – Measurement: length, time and mass
Week 2	Motion along a straight line
Week 3	Vectors I
Week 4	Vectors II
Week 5	Motion in two and three dimensions I
Week 6	Motion in two and three dimensions II
Week 7	Mid-term Exam + relative motion
Week 8	force, Newton's first law Newton's laws I
Week 9	Newton's second law and Newton's third law
Week 10	some particular forces, friction and terminal speed
Week 11	Kinetic energy and Work I
Week 12	Kinetic energy and Work II
Week 13	Potential energy I
Week 14	Potential energy II
Week 15	conservation of energy
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Simple pendulum experiment
Week 2	Lab 2: Helical spring experiment
Week 3	Lab 3: Coefficient of Friction Experiment
Week 4	Lab 4: The inclined surface experiment
Week 5	Lab 5: The compound pendulum experiment
Week 6	Lab 6: An experiment to find the moment of inertia of a cylinder rolling on an inclined surface
Week 7	Lab 7: An experiment to find the ground acceleration from the oscillation of a beam with a certain modulus of elasticity.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Fundamentals of university physics, volume 1: Alonso, J.finn,	Yes
Recommended Texts	Fundamentals of physics: David Halliday, Robert Resnick, John Wiley & Sons 2014	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

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	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.

MODULE DESCRIPTION
وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Electricity**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**PHY-112**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Physics		**College**	Science	
Module Leader	Ghada Ayad Kadhim		**e-mail**	gayad@uowasit.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee ApprovalDate	01/06/2023		**Version Number**	1.0	

Relation with other Modules العالقة 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 اهداف المادة الدراسية	1. To develop problem solving skills and understanding of charges and fields. 2. To understand the electric potential. 3. To understand the basic concept of electric fields around conductors. 4. To understand basic subject for all electric currents. 5. To understand the fields of moving charges. 6. To understand the relationship between electric potential and energy.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how charge works in electric fields. 2. List the various terms associated with electricity concepts. 3. Summarize what is meant by a basic electricity. 4. Describe electric fields, electric Flux, and force. 5. Define Gauss's Law. 6. Identify the basic applications of capacitance and capacitors. 7. Define Electric current and current density. 8. Discuss the various properties of Electromotive force and the voltaic cell. 9. Explain Conductors and insulators. 10. The vector calculus and differential equations techniques that are used to solve problems involving electric fields and potentials.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. ELECTROSTATICS: CHARGES AND FIELDS: Electric charge, Conservation of charge, Quantization of charge, Coulomb's law, Energy of a system of charges, Electrical energy in a crystal lattice, the electric field, Charge distributions, Flux, Gauss's law, Field of a spherical charge distribution, Field of a line charge, Field of an infinite flat sheet of charge, the force on a layer of charge, Energy associated with the electric field. [14 hr] THE ELECTRIC POTENTIAL: Line integral of the electric field, Potential difference and the potential function, Gradient of a scalar function, Derivation of the field from the potential, Potential of a charge distribution, Uniformly charged disk, Dipoles, Divergence of a vector function, Gauss's theorem and the differential form of Gauss's law, The divergence in Cartesian coordinates, The Laplacian, Laplace's equation, Distinguishing the physics from the mathematics, The curl of a vector function, Stokes' theorem, The curl in Cartesian coordinates, The physical meaning of the curl. [14 hr] ELECTRIC FIELDS AROUND CONDUCTORS: Conductors and insulators, Conductors in the electrostatic field, the general electrostatic problem and the uniqueness theorem, Image charges, Capacitance and capacitors, Potentials and charges on several conductors, Energy stored in a capacitor, Other views of the boundary-value problem. [14 hr]

	ELECTRIC CURRENTS: Electric current and current density, Steady currents and charge conservation, Electrical conductivity and Ohm's law, The physics of electrical conduction, Conduction in metals, Semiconductors, Circuits and circuit elements, Energy dissipation in current flow, Electromotive force and the voltaic cell, Networks with voltage sources, Variable currents in capacitors and resistors. [14 hr] THE FIELDS OF MOVING CHARGES: from Oersted to Einstein, Magnetic forces, Measurement of charge in motion, Invariance of charge, Electric field measured in different frames of reference, Field of a point charge moving with constant velocity, Field of a charge that starts or stops, Force on a moving charge, Interaction betweena moving charge and other moving charges. [14 hr]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	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 محسوب ل ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي الغير منتظم للطالب خلال الفصل	96	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	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	Electric charge, Conservation of charge, Quantization of charge, Coulomb's law, Energy of a system of charges,
Week 2	Electrical energy in a crystal lattice, the electric field, Charge distributions, Flux, Gauss's law, Field of a spherical charge distribution, Field of a line charge,
Week 3	Field of an infinite flat sheet of charge, the force on a layer of charge, Energy associated with the electric field
Week 4	Line integral of the electric field, Potential difference and the potential function, Gradient of a scalar function, Derivation of the field from the potential,
Week 5	Potential of a charge distribution, uniformly charged disk, Dipoles, Divergence of a vector function, Gauss's theorem and the differential form of Gauss's law,
Week 6	The divergence in Cartesian coordinates, The Laplacian, Laplace's equation, Distinguishing the physics from the mathematics, the curl of a vector function,
Week 7	Stokes' theorem, the curl in Cartesian coordinates, the physical meaning of the curl
Week 8	Midterm Exam
Week 9	Conductors and insulators, Conductors in the electrostatic field, the general electrostatic problem and the uniqueness theorem, Image charges, Capacitance and capacitors,
Week 10	Potentials and charges on several conductors, Energy stored in a capacitor, Other views of the boundary-value problem
Week 11	Electric current and current density, Steady currents and charge conservation, Electrical conductivity

	and Ohm’s law, The physics of electrical conduction,
Week 12	Conduction in metals, Semiconductors, Circuits and circuit elements, Energy dissipation in current flow, Electromotive force and the voltaic cell,
Week 13	from Oersted to Einstein, Magnetic forces, Measurement of charge in motion, Invariance of charge, Electric field measured in different frames of reference,
Week 14	Field of a point charge moving with constant velocity, Field of a charge that starts or stops,
Week 15	Force on a moving charge, Interaction between a moving charge and other moving charges
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: A study of the properties of inductance
Week 2	Lab 2: Study the properties of a capacitive
Week 3	Lab 3: Ohm's law calculation for small resistance
Week 4	Lab 4: Ohm's law calculation for large resistance
Week 5	Lab 5: Find the maximum capacity
Week 6	Lab 6: Calculating the time constant for the capacitance
Week 7	Lab 7: Graphical method for calculating the resistance of an ammeter

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Electricity and Magnetism, Edward M. Purcell's and David J. Morin, 3rd edition, Cambridge University Press, 2013	No
Recommended Texts	Electricity Demystified, Stan Gibilisco, 2nd edition, McGraw Hill, 2012	No
Websites	https://ocw.mit.edu/courses/8-02t-electricity-and-magnetism-spring-2005/pages/lecture-notes/	

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	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.

MODULE DESCRIPTION
وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Heat and Thermodynamic**			**Module Delivery**	
Module Type	**C**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**PHY-212**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	UGII		**Semester of Delivery**	1	
Administering Department	physics		**College**	Sciences	
Module Leader	Ahmed Khudhair Abbas Mehdi		**e-mail**	aalzubaidi@uowasit.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee ApprovalDate			**Version Number**		

Relation with other Modules العالقة 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 اهداف المادة الدراسية	1. This course deals with the basic concepts and definitions related to heat and thermodynamics. 2. To describe types of thermodynamic variables. 3. To study different thermodynamic processes 4. To distinguish different thermodynamic laws. 5. To solve thermodynamic problems related to ideal and real gases. 6. To application chain rule thermodynamically. 7. To convert among different temperature scales.
Module Learning Outcomes مخرجات التعلم المادة الدراسية	1. Recognize different definitions related to heat and thermodynamics. 2. Recognize types of thermodynamic coordinates. 3. Discuss different thermodynamic processes (isothermal, isometric, isobaric, and adiabatic processes) 4. Summarize what is meant by zeroth, and first law of thermodynamics. 5. understand triple point of water 6. knowing and understanding the kinetic theory of gases 7. Understanding the different ways of achieving work. 8. understanding the laws related to kinetic theory of gases (Boyl's law, Charles's law, Avogadro's law, Joule's law) 9. Recognize the difference between heat and temperature. 10. to understand the different roles of thermometers.
Indicative Contents المحتويات الارشادية	Indicative content includes the following. Part A - Fundamentals Introduction to thermal physics , Historical review , Zeroth law of thermodynamics [15 hrs] Homogeneous and heterogeneous systems and implicit and non-implicit quantities, Quasi-steady processes and reversible processes, The difference between heat and temperature and different temperature conversions [15 hrs] Measuring temperature and types of thermometers, Volume expansivity coefficient isothermal compressibility coefficients, • Isothermal, isometric and isobaric process for an ideal gas [15 hrs] Revision problem classes [3hrs]Part B – application Work and heat in thermodynamic processes , The first law of thermodynamics , Ca of isolated, closed, and adiabatic systems according to the first law[15 hrs] Heat capacity and specific heat capacity, Some consequences of the first law of thermodynamics. [15 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the discussions and solving 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 محسوب ل 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي الغير منتظم للطالب خلال الفصل	72	**Unstructured SWL (h/w)** ال الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	5% (5)	5, 10	LO #1, 3, 4 and 7
	Assignments	2	20% (20)	4, 12	LO # 3, 4, 7 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	5% (5)	13	All
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to thermal physics and definitions
Week 2	Related the thermodynamic coordinates to mathematical laws
Week 3	Homogeneous and heterogeneous systems and implicit and non-implicit quantities
Week 4	Zeroth law of thermodynamics and thermometers
Week 5	Quasi-steady processes and reversible processes
Week 6	The difference between heat and temperature and different temperature conversions
Week 7	Kinetic theory of gases with different laws of gases

Week 8	Equation of state for an ideal and real gases
Week 9	Volume expansivity coefficient and isothermal compressibility coefficient
Week 10	Isothermal, isometric and isobaric processes for an ideal gas
Week 11	Work and heat in thermodynamic processes
Week 12	The first law of thermodynamics
Week 13	Heat capacity and specific heat capacity
Week 14	Adiabatic process for an ideal and non ideal gases
Week 15	Some consequences of the first law of thermodynamics
Week 16	**Preparatory Week Before The Final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab1 : Experiment to achieve Newton's law of cooling
Week 2	Lab2 : Experiment to fulfill Boyle's law
Week 3	Lab3 : Experiment to calculate the heat capacity of oil using the mixing method
Week 4	Lab4: Experiment to calculate the coefficient of longitudinal expansion of metals
Week 5	Lab5 : An experiment that determines the melting point of wax from its cooling curve
Week 6	Lab6 : Experiment to calculate the apparent coefficient of expansion of liquids
Week 7	Lab7 : Experiment with resistance gradients and use them to measure temperatures
Week 8	Lab8 : Thermal machine work
Week 9	Lab9 : Experiment with the thermoelectric coupler gradient and its use as a thermometer
Week 10	Lab 10 : Calculate the coefficient of friction

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Thermodynamics, kinetic theory and statistical thermodynamics(sears and Salinger)	Yes
Recommended Texts	Heat and Thermodynamics (Mark W. Zemansky)	No
Websites	hyperphysics.phy-astr.gsu.edu	

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	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.

نموذج وصف المقرر

1. اسم المقرر
اللغة العربية
2. رمز المقرر
3. الفصل / السنة
الفصل الدراسي الثاني 2023-2024
4. تاريخ إعداد هذا الوصف:
2024/4/1
5. أشكال الحضور المتاحة
حضوري
6. عدد الساعات الدراسية (الكلي)/ عدد الوحدات (الكلي)
(2 ساعة نظري) اسبوعيا
7. اسم مسؤول المقرر الدراسي (إذا أكثر من اسم يذكر)
الاسم: م.م. أحمد عبد الحميد رسن **الإيميل:** ahmedabd@uowasit.edu.iq
8. اهداف المقرر

اهداف المادة الدراسية	معرفة القواعد النحوية والصرفية لتفادي الوقوع بالأخطاء اللغوية. - توظيف اللغة في كتابة الابحاث العلمية. - تنمية قدرة الطالب على الحوار والمناقشة والمشاركة -زيادة معرفة الطلاب عن طريق تكليفهم بأعداد تقارير خاصة باللغة العربية

9. استراتيجيات التعليم والتعلم

الاستراتيجية	- **المناقشات الجماعية وحل الواجبات** - **خلق اجواء المنافسة بين الطلبة وعلاج الفروقات الفردية باستخدام الوسائل التعليمية المناسبة** - **التقارير العلمية.** - **تضمين طرائق التدريس الحديثة** - **تشجيع الطلبة على التعلم الذاتي.**

10. بنية المقرر

الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع / المادة النظرية	المادة العملية	طريقة التقييم
1	2	يستهدف البرنامج طلبة المرحلة الاولى	**المقدمة** مادة الاملاء كتابة التاء والهاء ، الالف المقصورة والممدود	يقدم المحتوى النظري عن طريق المحاضرة و التوضيح على السبورة والمناقشات في الفصل الدراسي	يتم التقييم عن طريق الاختبارات المتعددة وتقييم التقارير
2	2	التنوين			التحضير اليومي والامتحانات اليومية والمناقشة
3	2	الحروف الشمسية والقمرية			التحضير اليومي والامتحانات اليومية والمناقشة

4	2	المشترك اللفظي			التحضير اليومي والامتحانات اليومية والمناقشة
5	2	البدل في اللغة			التحضير اليومي والامتحانات اليومية والمناقشة
6	2	التوكيد			امتحان
7	2		**امتحان شهري اول**	**امتحان شهري اول**	التحضير اليومي والامتحانات اليومية والمناقشة
8	2	الموشحات الاندلسية			التحضير اليومي والامتحانات اليومية والمناقشة
9	2	بناء الفعل للمجهول (نائب الفاعل)			التحضير اليومي والامتحانات اليومية والمناقشة
10	2	الاستثناء في اللغة			التحضير اليومي والامتحانات اليومية والمناقشة
11	4	المقامة			التحضير اليومي والامتحانات اليومية والمناقشة
12	4	النداء في اللغة العربية			التحضير اليومي والامتحانات اليومية والمناقشة
13	4	قصيدة المتنبي شرح وتحليل نقدي			التحضير اليومي والامتحانات اليومية والمناقشة
14	4	المبتدأ والخبر			التحضير اليومي والامتحانات اليومية والمناقشة
15	4	=	**امتحان شهري ثاني**	**امتحان شهري ثاني**	امتحان

11.تقييم المقرر

توزيع الدرجة من 100 على وفق المهام المكلف بها الطالب مثل التحضير اليومي والامتحانات اليومية والشفوية والشهرية والتحريرية والتقارير .... الخ

الفصل الدراسي	**النظري**			**الامتحان النهائي**
	الامتحان الاول	**الامتحان الثاني**	**النشاطات والكوزات**	
الثاني	**10**	**10**	**30**	**50**

12.مصادر التعلم والتدريس

الكتب المقررة المطلوبة (المنهجية أن وجدت)	كتاب اللغة العربية المنهجي
المراجع الرئيسة (المصادر)	
الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير....)	
المراجع الإلكترونية، مواقع الانترنيت	

MODULE DESCRIPTION
وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Modern Physics II**			**Module Delivery**	
Module Type	**C**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**PHY-221**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	2		**Semester of Delivery**	3	
Administering Department	physics		**College**	Sciences	
Module Leader	Muneer Hlail Jadua'a ALzubaidy		**e-mail**	@uowasit.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**	malzubaidy@uowasit.edu.iq	
Peer Reviewer Name			**e-mail**		
Scientific Committee ApprovalDate			**Version Number**	1.0	

Relation with other Modules العالقة 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 اهداف المادة الدراسية	1. Provide simple and clear explanations of the main physical concepts and theories of the twentieth century. 2. To illustrate these concepts and theories through a wide range of current applications and examples and to activate the text with brief drawings of the historical development of the concept of the duality of wave and particle properties of light. 3. To make the student understand how thinking has evolved around the need to find scientific explanations for some physical phenomena that did not have a clear scientific explanation. 4. To make the student understand the development of the concept of wave and wave function and the modern concept in physics. 5. To develop an understanding of quantum mechanics and the Schrödinger equation and its applications in many physical phenomena. 6. To enhance critical thinking, analytical reasoning and problem solving skills. 7. Give an understanding of nuclear radiation and nuclear reactions.
Module Learning Outcomes مخرجات التعلم المادة الدراسية	1 . Review the concept of waves and types of waves 2. Explain the necessity of considering light as particles 3. Review the concept of the duality of particle and wave properties of electromagnetic waves and provide an understanding of the practical applications of this concept. 4. Give an idea of the development of the concept presented by the scientist de Broglie for the wave nature of particles and the applications of this principle. 5. Review the nature of the wave function and how we can adopt it to understand the behavior of particles in quantum systems. 6. Provide an easy introduction to the basics of quantum mechanics and the Schroedinger equation and review modern applications of this equation. 7. Provide the necessary concepts and knowledge of nuclear physics and the basic concepts that the student must know at this stage of study.
Indicative Contents المحتويات الارشادية	Indicative content includes the following. Part A - Fundamentals waves and types of waves, the duality of particle and wave properties, for the wave nature of particles , The principle of duality of de Broglie [14 Hours] Review Problem Chapters [3 Hours] Part B – Application quantum mechanics Schroedinger equation [14 Hours] Atomic Components, Quantum Values and Review Problems [14 Hours] nuclear physics and the basic concepts [14 Hours] the radiation emitted by materials and to gain knowledge to study it[14 Hours]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in presenting this module is to encourage students' participation in explaining the daily lecture, clarifying modern physics concepts by comparing these concepts with what is around us in nature, and using meaningful and repetitive homework to encourage students to participate in the exercises and understand exercises and how to apply them, while at the same time refining and expanding students' scientific thinking skills.

Student Workload (SWL) الحمل الدراسي للطالب محسوب ل 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي الغير منتظم للطالب خلال الفصل	72	**Unstructured SWL (h/w)** ال الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	8, 12	LO #1, 2,3 , 4 5,6,7,and 8
	Assignments	2	10% (10)	2, 12	LO # 9, 10, 11 and 12
	Projects / Lab.	2	10% (10)	Continuous	All
	Report	2	20% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Wave properties
Week 2	Pauli's exclusion principle
Week 3	Photoelectric effect
Week 4	Compton phenomenon
Week 5	The de Broglie principle
Week 6	The principle of duality of de Broglie

Week 7	Midterm Exam

Week 8	Equation of motion of a wave packet
Week 9	Introduction to Quantum mechanics
Week 10	Schroedenker equation , Time-dependent Schroedenker equation
Week 11	The wave function and its physical interpretation
Week 12	Wave function
Week 13	Probability density
Week 14	Applications of the Schroedenker equation and Schroedenker equation for the hydrogen atom
Week 15	Nuclear analysis , Radioactivity and Types of nuclear reactions
Week 16	**Preparatory Week Before The Final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	مفاهيم في الفيزياء الحديثة ، تاليف ارثر بايزر – ترجمة : د.عبد المنعم مشكور د.شاكر جابر شاكر	Yes
Recommended Texts	**Modern Physics , Uttarakhand Open University, Haldwani, Nainital- 263139**	No
Websites	chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.uou.ac.in/sites/default/files/slm/BSCPH-302.pdf	

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	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded

Group(0 – 49)	**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.

MODULE DESCRIPTION
وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Modern Physics I**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**PHY-211**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	2		**Semester of Delivery**	3	
Administering Department	physics		**College**	Sciences	
Module Leader	Muneer Hlail Jadua'a ALzubaidy		**e-mail**	@uowasit.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**	malzubaidy@uowasit.edu.iq	
Peer Reviewer Name			**e-mail**		
Scientific Committee ApprovalDate			**Version Number**	1.0	

Relation with other Modules العالقة 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 اهداف المادة الدراسية	1. Provide simple and clear explanations of the main physical concepts and theories of the twentieth century. 2. . Illustrate these concepts and theories through a wide range of current applications and examples and activate the text with brief drawings of the historical development of physics in the twentieth century. 3. . Make the student understand how thinking has evolved around the need to find scientific explanations for some physical phenomena that did not have a clear scientific explanation. 4. . Make the student understand the development of the concept of atomic models. 5. . Develop an understanding of the current basis of broad knowledge in modern physics. 6. . Promote critical thinking, analytical reasoning and problem-solving skills. 7. . Discuss the problems facing modern physics in the twenty-first century.
Module Learning Outcomes مخرجات التعلم المادة الدراسية	1. Review the units that will be used to understand modern physics and clarify some of the basic concepts that the student needs to understand the atom. 2. Identify the most important physical problems and phenomena that lacked scientific explanation. 3. Learn about atomic models and develop an understanding of the atom. 4. Identify the components of corn and their quantitative values. 5. Knowing the spectral series of the hydrogen atom and how to calculate the frequencies of the radiation emitted by the atom. 6. Recognize Quantitative numbers, Pauli's exclusion principle , Quantum theory of the hydrogen atom , Angular momentum of electrons, orbital angular momentum and electron spin. 7. Identifying the types of spectra and their sources 8. Get basic concepts about X-ray , how it is generated, and types of X-ray spectra. 9. To learn about the radiation emitted by materials and to gain knowledge to study it.
Indicative Contents المحتويات الارشادية	Indicative content includes the following. Part A - Fundamentals Units, Modern Physical Concepts, Atomic Models, Spectral Series, Calculation of Emitted Spectra from an Atom [14 Hours] Atomic Components, Quantum Values and Review Problems [14 Hours] Review Problem Chapters [3 Hours] Part B – Application Quantitative numbers, Pauli's exclusion principle , Quantum theory of the hydrogen atom , Angular momentum of electrons, orbital angular momentum and electron spin. The types of spectra and their sources [14 Hours] X-ray , how it is generated, and types of X-ray spectra [14 Hours] the radiation emitted by materials and to gain knowledge to study it[14 Hours]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in presenting this module is to encourage students' participation in explaining the daily lecture, clarifying modern physics concepts by comparing these concepts with what is around us in nature, and using meaningful and repetitive homework to encourage students to participate in the exercises and understand exercises and how to apply them, while at the same time refining and expanding students' scientific thinking skills.

Student Workload (SWL) الحمل الدراسي للطالب محسوب ل 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي الغير منتظم للطالب خلال الفصل	72	**Unstructured SWL (h/w)** ال الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	8, 12	LO #1, 2,3 , 4 5,6,7,and 8
	Assignments	2	10% (10)	2, 12	LO # 9, 10, 11 and 12
	Projects / Lab.	2	10% (10)	Continuous	All
	Report	2	20% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Atomic models
Week 2	Quantitative numbers, Pauli's exclusion principle
Week 3	Quantum theory of the hydrogen atom
Week 4	Zeeman effect, Applications
Week 5	Atomic spectra

Week 6	Hydrogen atom spectrum series
Week 7	Midterm Exam

Week 8	Molecular spectra
Week 9	Boltzmann distribution
Week 10	Rotational spectrum, vibrational spectrum
Week 11	X-rays, continuous and sharp spectrum
Week 12	Continuous and sharp spectrum
Week 13	the radiation emitted by materials blackbody radiation)
Week 14	Rayleigh and Jeans' explanation of blackbody radiation
Week 15	Planck's explanation of blackbody radiation
Week 16	**Preparatory Week Before The Final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	مفاهيم في الفيزياء الحديثة ، تاليف ارثر بايزر – ترجمة : د.عبد المنعم مشكور د.شاكر جابر شاكر	Yes
Recommended Texts	**Modern Physics , Uttarakhand Open University, Haldwani, Nainital- 263139**	No
Websites	chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.uou.ac.in/sites/default/files/slm/BSCPH-302.pdf	

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	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.

MODULE DESCRIPTION
وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Numerical analysis**			**Module Delivery**	
Module Type	**basic**			☒ **Theory** ☐ **Lecture** ☒**Lab** **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**PHY-216**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Physics		**College**	Sciences	
Module Leader	Mutasim Ibrahim Malik		**e-mail**	@uowasit.edu.iq	
Module Leader's Acad. Title	Assist.Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**	mutasim@uowasit.edu.iq	
Peer Reviewer Name			**e-mail**		
Scientific Committee ApprovalDate	01/06/2023		**Version Number**	1.0	

Relation with other Modules العالقة 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 اهداف المادة الدراسية	1. This course deals with the how to get numerical solutions for polynomial differential equations, integration and curve fitting 2. Enabling the student to write a program that describes all these numerical analysis issues, 3. as well as building the student's ability to develop the skill of dealing with numbers to find solutions with the least errors, 4. then comparing the solutions he reached with the analytical solutions, as well as discussing the causes of the error.
Module Learning Outcomes مخرجات التعلم المادة الدراسية	1. Make the student able to solve numerical analysis problems in a shorter time and with few or no errors. 2. Make the student able to formulate the problems and ideas of this subject in the form of programs that can change the inputs to obtain the outputs and comparison. 3. Make the student able to distinguish between each method and compare them as well as calculate the error for each method and know the reasons for the error. 4. Make the student able to deal with new ideas within this field as well as find solutions for them. Make the student able to apply these ideas in similar situations and develop appropriate solutions for them.
Indicative Contents المحتويات الارشادية	Indicative content includes the following. Main computers components Flowchart and algorithm, Solution of equation with one variable Fixed point Iteration Method, Bisection Method, false position method, Secant method(14hrs), Revision problem classes [3hrs] … Numerical solution of ordinary differential equation, Euler method, Improve Euler method, Runge-kutta method, Integration ,rectangular method, Integration ,rectangular method. Trapezoidal, method Simpsons rule Curve fitting, least square criteria, least square linear Least square parabola Least square exponential.(14hr),

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, using concepts in numerical analysis vocabulary, meaningful and frequent homework to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills.

Student Workload (SWL) الحمل الدراسي للطالب محسوب ل 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل		**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي الغير منتظم للطالب خلال الفصل		**Unstructured SWL (h/w)** ال الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل			

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	8, 12	LO #1, 2,3 , 4 5,6,7,and 8
	Assignments	2	10% (10)	2, 12	LO # 9, 10, 11 and 12
	Quizzes / Lab.	2	10% (10)	Continuous	All
	Report / Lab.	2	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	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	Main computers components Flowchart and algorithm
Week 2	Solution of equation with one variable Fixed point Iteration Method
Week 3	Bisection Method
Week 4	false position method
Week 5	Newton-raphson method
Week 6	Secant method
Week 7	Midterm Exam

Week 8	Numerical solution of ordinary differential equation, Euler method
Week 9	Improve Euler method
Week 10	Runge-kutta method
Week 11	Integration ,rectangular method
Week 12	Trapezoidal method
Week 13	Simpsons rule
Week 14	Curve fitting, least square criteria, least square linear
Week 15	Least square parabola
Week 16	Least square exponential.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Introduction to numerical analysis	Yes
Recommended Texts	An introduction to numerical analysis second edition, kendall E. Atkinson, john wiley&sons	No
Websites	https://faculty.ksu.edu.sa/sites/default/files/numerical_analysis_9th.pdf	

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	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.

MODULE DESCRIPTION
وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Analytical Mechanics II**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**PHY-223**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	2		**Semester of Delivery**	4	
Administering Department	physics		**College**	Sciences	
Module Leader	Shaymaa Saadoon Hashim		**e-mail**	shhashim@uowasit.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor	N.A.		**e-mail**	N.A.	
Peer Reviewer Name	N.A.		**e-mail**	N.A.	
Scientific Committee ApprovalDate			**Version Number**	1.0	

Relation with other Modules العالقة 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 اهداف المادة الدراسية	1. Make the student able to understand and know the basics of analytical mechanics 2. Make the student able to understand and know the practical applications of analytical mechanics 3. Make the student able to derive kinetic and potential motion equations 4. Provide a mathematically sophisticated reformulation of Newtonian mechanics and build up a good foundation in analytical mechanics. 5. To acquire capabilities to perform analysis of the classic mechanical phenomena. 6. Solve variety of problems analytically and systematically with confidence
Module Learning Outcomes مخرجات التعلم المادة الدراسية	1- Enabling students to obtain knowledge and understanding of the topics of vector analysis and kinematics. 2- Enabling students to obtain knowledge and understanding of applications of analytical mechanics 3- Enabling students to obtain knowledge and understanding of the use of various physical laws in solving problems 4- Knowledge on constraints, generalized coordinates, velocities and accelerations. 5- Knowledge on calculus of variations and the concept of virtual displacement.
Indicative Contents المحتويات الارشادية	Indicative content includes the following. Part A - Fundamentals Oscillations [14 hrs] Damped Harmonic Motion. [14 hrs] Revision problem classes [3hrs] Part B – application Mechanics of a Rigid Body [13 hrs] Lagrange's Equations.[13 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, using concepts in math and mechanics vocabulary, meaningful and frequent homework to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills.

Student Workload (SWL) الحمل الدراسي للطالب محسوب ل 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي الغير منتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** ال الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	8, 12	All
	Assignments	2	10% (10)	2, 12	All
	H. W	2	10% (10)	3,8	All
	Report	2	10% (10)	13	All
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	All
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Oscillations, Linear Restoring Force.
Week 2	Energy Considerations in Harmonic Motion.
Week 3	Damped Harmonic Motion.
Week 4	Energy Considerations in Damped Harmonic Motion.
Week 5	Mechanics of a Rigid Body, Motion in a plain.
Week 6	Center of Mass of a Rigid Body, Static Equilibrium of a Rigid Body.
Week 7	Midterm Exam

Week 8	Angular Momentum of a rigid Body. Momentum of Inertia, Principal Axes of a rigid Body.
Week 9	Collision of Rigid Bodies
Week 10	Rotational Kinetic Energy, Moment of Inertia of a rigid Body about an Arbitrary Axis.
Week 11	Free Rotation of a Rigid Body Under no Forces. Geometric Description of the Motion
Week 12	Free Rotation of a Rigid Body with an Axis of Symmetry. Analytical Treatment
Week 13	Generalized Coordinates, Generalized Forces, Lagrange's Equations.
Week 14	Lagrange's Equations for Impulsive Forces, Hamilton's Variational Principle.
Week 15	Potential Energy and Equilibrium. Expansion of the Potential – energy Function in a power Series.
Week 16	**Preparatory Week Before the Final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Analytical Mechanics / by Grant R. Fowles (7th edition)	Yes
Recommended Texts		
Websites	All Websites explain Analytical mechanics	

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	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.

MODULE DESCRIPTION
وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Analytical Mechanics I**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**PHY-213**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	physics		**College**	Sciences	
Module Leader	Shaymaa Saadoon Hashim		**e-mail**	shhashim@uowasit.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**	i@uokufa.edu.iq	
Peer Reviewer Name			**e-mail**		
Scientific Committee ApprovalDate			**Version Number**	1.0	

Relation with other Modules العالقة 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 اهداف المادة الدراسية	1. Make the student able to understand and know the basics of analytical mechanics 2. Make the student able to understand and know the practical applications of analytical mechanics 3. Make the student able to derive kinetic and potential motion equations 4. Provide a mathematically sophisticated reformulation of Newtonian mechanics and build up a good foundation in analytical mechanics. 5. To acquire capabilities to perform analysis of the classic mechanical phenomena. 6. Solve variety of problems analytically and systematically with confidence
Module Learning Outcomes مخرجات التعلم المادة الدراسية	1- Enabling students to obtain knowledge and understanding of the topics of vector analysis and kinematics. 2- Enabling students to obtain knowledge and understanding of applications of analytical mechanics 3- Enabling students to obtain knowledge and understanding of the use of various physical laws in solving problems 4- Knowledge on constraints, generalized coordinates, velocities and accelerations. 5- Knowledge on calculus of variations and the concept of virtual displacement.
Indicative Contents المحتويات الارشادية	Indicative content includes the following. Part A - Fundamentals Introduction, Overview, Vectors, Derivation, [14 hrs] Position vector of a Particle, Velocity Vector, Acceleration Vector [14 hrs] Revision problem classes [3hrs] Part B – application Newton's laws of motion, Newton's First Law. Inertial Reference Systems Mass and Force. Newton's Second and Third Laws [13 hrs] Linear Momentum, Motion of a Particle, Rectilinear Motion. The Force as a Function of Position Only. The concepts of Kinetic and Potential Energy. [13 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, using concepts in math and mechanics vocabulary, meaningful and frequent homework to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills.

Student Workload (SWL) الحمل الدراسي للطالب محسوب ل 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي الغير منتظم للطالب خلال الفصل	52	**Unstructured SWL (h/w)** ال الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	8, 12	LO #1, 2,3 , 4 5,6,7,and 8
	Assignments	2	10% (10)	2, 12	LO # 9, 10, 11 and 12
	Projects / Lab.	0	0% (10)	Continuous	All
	Report	2	20% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	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, Overview, Vectors
Week 2	Position vector of a Particle, Velocity Vector, Acceleration Vector.
Week 3	Derivatives of Products of Vectors, Tangential and Normal Components of Acceleration
Week 4	Velocity and Acceleration in Plane polar coordinates
Week 5	Velocity and Acceleration in Cylindrical and Spherical Coordinates
Week 6	Newton's laws of motion, Newton's First Law. Inertial Reference Systems
Week 7	Midterm Exam

Week 8	Mass and Force. Newton's Second and Third Laws
Week 9	Linear Momentum, Motion of a Particle, Rectilinear Motion.
Week 10	The Force as a Function of Position Only. The concepts of Kinetic and Potential Energy.
Week 11	The Force as a Function of Velocity Only, The Force as a Function Time Only
Week 12	Vertical Motion in a resisting Medium Terminal Velocity
Week 13	The Work Principle, Conservation Force and Force Fields, Potential Energy Function.
Week 14	Condition for the Existence of a Potential Function. The Del Operator.
Week 15	.Motion of Charged Particles in Electric and Magnetic Fields.
Week 16	**Preparatory Week Before the Final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Analytical Mechanics / by Grant R. Fowles (7th edition)	Yes
Recommended Texts		
Websites	All Websites explain Analytical mechanics	

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	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.

MODULE DESCRIPTION
وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Heat and Thermodynamic**			**Module Delivery**	
Module Type	**C**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**PHY-212**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	UGII		**Semester of Delivery**	1	
Administering Department	physics		**College**	Sciences	
Module Leader	Ahmed Khudhair Abbas Mehdi		**e-mail**	aalzubaidi@uowasit.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee ApprovalDate			**Version Number**		

Relation with other Modules العالقة 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 اهداف المادة الدراسية	1. This course deals with the basic concepts and definitions related to heat and thermodynamics. 2. To describe types of thermodynamic variables. 3. To study different thermodynamic processes 4. To distinguish different thermodynamic laws. 5. To solve thermodynamic problems related to ideal and real gases. 6. To application chain rule thermodynamically. 7. To convert among different temperature scales.
Module Learning Outcomes مخرجات التعلم المادة الدراسية	1. Recognize different definitions related to heat and thermodynamics. 2. Recognize types of thermodynamic coordinates. 3. Discuss different thermodynamic processes (isothermal, isometric, isobaric, and adiabatic processes) 4. Summarize what is meant by zeroth, and first law of thermodynamics. 5. understand triple point of water 6. knowing and understanding the kinetic theory of gases 7. Understanding the different ways of achieving work. 8. understanding the laws related to kinetic theory of gases (Boyl's law, Charles's law, Avogadro's law, Joule's law) 9. Recognize the difference between heat and temperature. 10. to understand the different roles of thermometers.
Indicative Contents المحتويات الارشادية	Indicative content includes the following. Part A - Fundamentals Introduction to thermal physics , Historical review , Zeroth law of thermodynamics [15 hrs] Homogeneous and heterogeneous systems and implicit and non-implicit quantities, Quasi-steady processes and reversible processes, The difference between heat and temperature and different temperature conversions [15 hrs] Measuring temperature and types of thermometers, Volume expansivity coefficient isothermal compressibility coefficients, • Isothermal, isometric and isobaric process for an ideal gas [15 hrs] Revision problem classes [3hrs]Part B – application Work and heat in thermodynamic processes , The first law of thermodynamics , Ca of isolated, closed, and adiabatic systems according to the first law[15 hrs] Heat capacity and specific heat capacity, Some consequences of the first law of thermodynamics. [15 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the discussions and solving 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 محسوب ل 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي الغير منتظم للطالب خلال الفصل	72	**Unstructured SWL (h/w)** ال الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	5% (5)	5, 10	LO #1, 3, 4 and 7
	Assignments	2	20% (20)	4, 12	LO # 3, 4, 7 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	5% (5)	13	All
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to thermal physics and definitions
Week 2	Related the thermodynamic coordinates to mathematical laws
Week 3	Homogeneous and heterogeneous systems and implicit and non-implicit quantities
Week 4	Zeroth law of thermodynamics and thermometers
Week 5	Quasi-steady processes and reversible processes
Week 6	The difference between heat and temperature and different temperature conversions
Week 7	Kinetic theory of gases with different laws of gases

Week 8	Equation of state for an ideal and real gases
Week 9	Volume expansivity coefficient and isothermal compressibility coefficient
Week 10	Isothermal, isometric and isobaric processes for an ideal gas
Week 11	Work and heat in thermodynamic processes
Week 12	The first law of thermodynamics
Week 13	Heat capacity and specific heat capacity
Week 14	Adiabatic process for an ideal and non ideal gases
Week 15	Some consequences of the first law of thermodynamics
Week 16	**Preparatory Week Before The Final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab1 : Experiment to achieve Newton's law of cooling
Week 2	Lab2 : Experiment to fulfill Boyle's law
Week 3	Lab3 : Experiment to calculate the heat capacity of oil using the mixing method
Week 4	Lab4: Experiment to calculate the coefficient of longitudinal expansion of metals
Week 5	Lab5 : An experiment that determines the melting point of wax from its cooling curve
Week 6	Lab6 : Experiment to calculate the apparent coefficient of expansion of liquids
Week 7	Lab7 : Experiment with resistance gradients and use them to measure temperatures
Week 8	Lab8 : Thermal machine work
Week 9	Lab9 : Experiment with the thermoelectric coupler gradient and its use as a thermometer
Week 10	Lab 10 : Calculate the coefficient of friction

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Thermodynamics, kinetic theory and statistical thermodynamics(sears and Salinger)	Yes
Recommended Texts	Heat and Thermodynamics (Mark W. Zemansky)	No
Websites	hyperphysics.phy-astr.gsu.edu	

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	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.

MODULE DESCRIPTION
وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Thermodynamics and Statistical Thermodynamics**			**Module Delivery**	
Module Type	**C**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**PHY-222**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	UGII		**Semester of Delivery**	1	
Administering Department	physics		**College**	Sciences	
Module Leader	Ahmed Khudhair Abbas Mehdi		**e-mail**	aalzubaidi@uowasit.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee ApprovalDate			**Version Number**		

Relation with other Modules العالقة 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 اهداف المادة الدراسية	1. This course deals with concepts of the second law of thermodynamics. 2. To describe concept of Entropy of a system 3. To study different thermodynamic cycles and engines 4. To distinguish between internal and external combustion engines.. 5. To solve thermodynamic problems related to the consequences of second law of thermodynamics. 6. To application Maxwell's equations thermodynamically. 7. To study different statistical laws and their applications.
Module Learning Outcomes مخرجات التعلم المادة الدراسية	1. Recognize different definitions related to the second law of thermodynamics/. 2. Recognize types of different statements of second law of thermodynamic: engines and refrigerators.. 3. Discuss different types of cycles 4. Summarize what is meant by internal and external combustion engines. 5. combining first and second law of thermodynamics 6. knowing and understanding the free functions and thermodynamic potentials. 7. Understanding the different ways of connection Maxwell/s equations with Thermodynamics. 8. understanding the laws related to Statistical thermodynamics (Maxwell-Boltzmann law, Fermi-Dirac law, Bose-Einstein law) 9. Recognize the applications of all laws of statistical thermodynamics..
Indicative Contents المحتويات الارشادية	Indicative content includes the following. Part A - Fundamentals Introduction to the second law of thermodynamics , Kelvin- Blanck statement, Clauisus statement , concept of entropy, laws of entropy, heat engine, efficiency of heat engine, types of cycles ,Carnot cycle and its efficiency , Otto cycle and its efficiency, Stirling cycle and its efficiency, Diesel engine and its efficiency, combined first and second law of thermodynamics [15 hrs] Definition of free functions in thermodynamics, Gibbs function, Helmholtz function, definition of thermodynamic potentials, related different free functions (Gibbs and Helmholtz) with Enthalpy and internal energy in thermodynamical systems, Gibbs and Helmholtz equations, Maxwell's equations, relating partition function with free functions and enthalpy equations, calculation of entropy, pressure, enthalpy , Gibbs function and Helmholtz function for different partition functions. [15 hrs] Revision problem classes[3hrs] Part B – application Statistical thermodynamics, Maxwell-Boltzmann statistics, applications of Maxwell Boltzmann statistics, Fermi-Dirac statistics, applications of Fermi-Dirac statistics, Bo Einstein statistics, applications of Bose-Einstein statistics. [15 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the discussions and solving 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 محسوب ل 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي الغير منتظم للطالب خلال الفصل	72	**Unstructured SWL (h/w)** ال الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	5% (5)	5, 10	LO #1, 3, 4 and 7
	Assignments	2	20% (20)	4, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	5% (5)	13	All
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to the second law of thermodynamics , Kelvin- Blanck statement, Clauisus statement , concept of entropy, laws of entropy
Week 2	heat engine, efficiency of heat engine, types of engines, types of cycles
Week 3	Carnot cycle and its efficiency , Otto cycle and its efficiency, Stirling cycle and its efficiency, Diesel engine and its efficiency
Week 4	combined first and second law of thermodynamics [
Week 5	Definition of free functions in thermodynamics, Gibbs function, Helmholtz function
Week 6	definition of thermodynamic potentials, related different free functions (Gibbs and Helmholtz) with Enthalpy and internal energy in thermodynamical systems
Week 7	Gibbs and Helmholtz equations, Maxwell's equations, relating partition function with free functions and enthalpy equations

Week 8	calculation of entropy, pressure, enthalpy , Gibbs function and Helmholtz function for different partition functions
Week 9	Statistical thermodynamics, definition of statistical mechanic, definition of cell, differentiation between macrostates and microstates in statistical thermodynamics
Week 10	Phase space and 6 dimensional space in statistical thermodynamics, density of particles in phase space, Definition of thermodynamic probability relation between thermodynamic probability with energy stat in statistical thermodynamics.,
Week 11	Types of statistical thermodynamics, definition of Maxwell-Boltzmann statistics, definition of Fermi-Dirac statistics, definition of Bose-Einstein statistics
Week 12	applications of Maxwell-Boltzmann statistics
Week 13	applications of Fermi-Dirac statistics
Week 14	applications of Bose-Einstein statistics
Week 15	Some consequences related to different methods of statistical thermodynamics.
Week 16	**Preparatory Week Before The Final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab1 : Experiment of Finding the specific heat capacity of copper by converting mechanical energy into heat (Calender's device)
Week 2	Lab2 : Experiment to fulfill Joule equivalent
Week 3	Lab3 : Experiment of Finding the viscosity coefficient of water using a capillary tube
Week 4	Lab4: Experiment of Investigating Stefan's law
Week 5	Lab5 : An experiment of Calculating the specific heat capacity of a piece of metal
Week 6	Lab6 : Experiment to Determine the thermal conductivity coefficient of a poor conductor of heat using the (Lee disk) method
Week 7	Lab7 : Experiment of Determining the latent heat of fusion of ice
Week 8	Lab8 : Calculating the mixing temperature of water

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Thermodynamics, kinetic theory and statistical thermodynamics(sears and Salinger)	Yes
Recommended Texts	Heat and Thermodynamics (Mark W. Zemansky)	No
Websites	hyperphysics.phy-astr.gsu.edu	

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	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.

MODULE DESCRIPTION
وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Mathematics**			**Module Delivery**	
Module Type	**C**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**PHY-215**				
ECTS Credits	**4**				
SWL (hr/sem)	**125**				
Module Level	2		**Semester of Delivery**	1	
Administering Department	Physics		**College**	Science	
Module Leader	Najlaa Jerjack Abdullah Karmsh		**e-mail**	njerjack@uowasit.edu.iq	
Module Leader's Acad. Title	Asst. Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee ApprovalDate	1/9/2024		**Version Number**		

Relation with other Modules العالقة 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 اهداف المادة الدراسية	1. This course deals with the basic concepts and definitions related to differential and integration and its applications in physics. 2. Studying mathematical material related to the study of physics by focusing on important concepts and functions Used in physics. 3. Study complex numbers and some theorems related to it. 4. To solve mathematical problems related to integrations.
Module Learning Outcomes مخرجات التعلم المادة الدراسية	1. Recognize different definitions related to complex numbers. 2. Recognize Type of integration. 3.Discuss the derivative of functions 4. .Discuss the integration of functions 5.understand the integral of trigonometric functions 6.know Exponential functions 7.Define Grammars role 8. Identify the basic integral exponential functions and their applications.
Indicative Contents المحتويات الارشادية	Indicative content includes the following. Part A - Fundamentals Introduction to complex numbers , Properties of complex numbers , Polar form of complex numbers, De Moivre's theorem, Euler's formula [14 hrs.] Differentiation, Basic Rules of Integration, Integration by Substitution, Integration of Rational Functions by Partial Fractions and solving a group from exercises [14 hrs.] Revision problem classes [3hrs] Part B – application Complex numbers, Polar form of complex numbers, De Moivre's theorem, Euler's formula [13 hrs.] Differentiation, Basic Rules of Integration, Applications of integration in physics [13 hrs.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, using concepts in math vocabulary, meaningful and frequent homework to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills.

Student Workload (SWL) الحمل الدراسي للطالب محسوب ل 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي الغير منتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** ال الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	8, 12	LO #1, 2,3 , 4 5,6,7,and 8
	Assignments	2	10% (10)	2, 12	LO # 9, 10, 11 and 12
	Projects / Lab.	0	10% (10)	Continuous	All
	Report	2	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	20% (10)	7	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	Complex numbers
Week 2	Properties of complex numbers
Week 3	Polar form of complex numbers
Week 4	De Moivre's theorem
Week 5	Euler's formula
Week 6	solving a group from exercises
Week 7	Midterm Exam

Week 8	Differentiation
Week 9	Basic Rules of Integration
Week 10	solving a group from exercises
Week 11	Integration by Substitution
Week 12	Integration by Parts
Week 13	Trigonometric Integration
Week 14	Integration of Rational Functions by Partial Fractions and solving a group from exercises
Week 15	Applications of integration in physics
Week 16	**Preparatory Week Before The Final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Calculus	Yes
Recommended Texts	MATHEMATICAL METHODS FOR PHYSICISTS MATHEMATICAL METHODS IN THE PHYSICAL SCIENCES	No
Websites	https://www.wolframalpha.com/	

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	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.

MODULE DESCRIPTION
وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Mathematics**			**Module Delivery**	
Module Type	**C**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code					
ECTS Credits					
SWL (hr/sem)	**125**				
Module Level	2		**Semester of Delivery**	2	
Administering Department	Physics		**College**	Science	
Module Leader	Najlaa Jerjack Abdullah Karmsh		**e-mail**	njerjack@uowasit.edu.iq	
Module Leader's Acad. Title	Asst. Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee ApprovalDate	15/1/2025		**Version Number**		

Relation with other Modules العالقة 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 اهداف المادة الدراسية	1. This course deals with the basic concepts and definitions related to matrices and its applications in physics. 2. Studying mathematical material related to the study of physics by focusing on important concepts and functions Used in physics. 3. Study differential equations and its types.
Module Learning Outcomes مخرجات التعلم المادة الدراسية	1. Recognize different definitions related to matrices. 2. Recognize type of matrices. 3.Discuss the operations on matrices 4. .Discuss the applications of determinants 5.understand the differential equations 6.know types of differential equations
Indicative Contents المحتويات الارشادية	Indicative content includes the following. Part A - Fundamentals Introduction to matrices, Properties of matrices, Types of matrices, Operations on matrices, solving a group from exercises [14 hrs.] Applications of determinants, Differential equations, Formation of Differential equations, Ordinary differential equation, Homogeneous differential equations, Exact differential equations, solving a group from exercises [14 hrs.] Revision problem classes [3hrs] Part B – application Applications of determinants, Differential equations and its applications, [13 hrs.] Application of some differential equations, Applications of matrices in physics [13 hrs.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, using concepts in math vocabulary, meaningful and frequent homework to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills.

Student Workload (SWL) الحمل الدراسي للطالب محسوب ل 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي الغير منتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** ال الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	8, 12	LO #1, 2,3 , 4 5,6,7,and 8
	Assignments	2	10% (10)	2, 12	LO # 9, 10, 11 and 12
	Projects / Lab.	0	10% (10)	Continuous	All
	Report	2	0% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	20% (10)	7	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	matrices
Week 2	Properties of matrices
Week 3	Types of matrices
Week 4	Operations on matrices
Week 5	Applications of determinants
Week 6	solving a group from exercises
Week 7	Midterm Exam

Week 8	Differential equations
Week 9	Formation of Differential equations
Week 10	Types of differential equations
Week 11	Ordinary differential equation
Week 12	Linear differential equation
Week 13	Homogeneous differential equations, Exact differential equations
Week 14	Partial differential equations
Week 15	solving a group from exercises
Week 16	**Preparatory Week Before The Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. جبر المصفوفات –للمرحلة الجامعية 2. نظريات ومسائل في المصفوفات	Yes
Recommended Texts	Ordinary and partial differential equations	No
Websites	http://www.stat.uchicago.edu/~lekheng/courses/309/books/Bernstein.pdf	

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	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.

MODULE DESCRIPTION
وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Analog Electronic**			**Module Delivery**	
Module Type	**Basic**			☐ **Theory** ☒**Lecture** ☒**Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**PHY-113**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		**1**	**Semester of Delivery**		1
Administering Department		physics	**College**		Sciences
Module Leader	Ahmed Abdul Mahdi Abdul Kareem		**e-mail**		aalamahdi@uowasit.edu.iq
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor			**e-mail**		aalamahdi@uowasit.edu.iq
Peer Reviewer Name			**e-mail**		
Scientific Committee ApprovalDate		29/09/2024	**Version Number**		1.0

Relation with other Modules العالقة 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 اهداف المادة الدراسية	The course aims to provide students with information and skills about semiconductor materials, their properties, methods of measurement, and their applications that benefit the student at the advanced university level, which can qualify him for postgraduate studies in the physical sciences, and to build a strong background for those who will continue in the specialization of solid-state physics and materials.
Module Learning Outcomes مخرجات التعلم المادة الدراسية	1- Enable the student to identify the division of solid materials in terms of electrical conduction 2- Enable the student to identify the physical properties of semiconductor materials, especially silicon and germanium 3- Learn how to obtain a positively charged semiconductor junction (N-type) 4- Learn how to obtain a negatively charged semiconductor junction (P-type) 5- Learn the physical properties of the N-P junction or what is called a diode 6- Learn about the applications of the diode and its benefit in electrical circuits 7- Learn about the physical properties of the transistor or what is called the N-P-N j
Indicative Contents المحتويات الارشادية	Indicative content includes the following. Part A - Fundamentals Conductors, Semiconductors, Insulators, Covalent bonds, valence electrons , Properties of Silicone Material, Properties of Germanium Material, valence band and conduction band, Meaning of Holes and Electrons, n-type semiconductor, p-type semiconductor, n-p junction (Diode), Properties of Diode, n-p-n junction (transistor), p-n-p junction (transistor), Bipolar Junction Transistor (BJT), properties of transistors, Common Base Connection properties, Common Emitter Connection properties, Common Collector Connection properties. Part B – application Half-Wave Rectifiers, Half-Wave Rectifiers With Center Taped Transformer, Full- Wave Rectifiers With Transformer, Full- Wave Bridge Rectifiers, Filters, Different Types of Half and Full Wave Clippers or Diode Limiters.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, using concepts in analog electronic vocabulary, meaningful and frequent homework to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب ل 15 اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي الغير منتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** ال الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	8, 12	LO #1, 2,3 , 4 5,6,7,and 8
	Assignments	2	10% (10)	2, 12	LO # 9, 10, 11 and 12
	Projects / Lab.	0	0% (10)	Continuous	All
	Report	2	20% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	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	The energy band in solid materials
Week 2	Intrinsic semiconductor,
Week 3	Extrinsic semiconductor
Week 4	The Diode
Week 5	The diode equations, V-I characteristic
Week 6	Diode applications: 1-Half -wave rectifiers
Week 7	2-Full -wave rectifiers
Week 8	3- Filters
Week 9	The bipolar junction transistor (BJT)
Week 10	Current and Voltage Analysis
Week 11	Common Base Configuration

Week 12	Common Emitter configuration
Week 13	Common Collector Connection
Week 14	Limits of Operation
Week 15	Linear Operation
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Electronic principle 8th edition by albert malvino	Yes
Recommended Texts	1- Electronic Devices 7th edition by Thomas L. Floyd 2- Electronic Devices and Circuit Theory 7th edition by Robert L. Boylestad	No
Websites		

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
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