

## Academic Program Description Form

University Name: Al Nahrain University

Faculty/Institute: College of Science

Scientific Department: Physics

Academic or Professional Program Name: B.Sc in Physics, higher education

Final Certificate Name: B.Sc, MSc, Ph.D

Academic System: Semester

Description Preparation Date: 2024-2024

File Completion Date: 2024

Signature: Saad N. Abood

Head of Department Name:

Prof Dr Saad Naji Abood

Date: 2024/10/16

Signature:

Scientific Associate Name:

Manaf Adnan Saleh

Date: 29/10/2024

The file is checked by: Manaf Adnan Saleh

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean



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



## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	ELECTRICITY AND MAGNETISM I		Module Delivery	
Module Type	CORE		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	PHYS112			
ECTS Credits	8			
SWL (hr/sem)	220			
Module Level	1	Semester of Delivery		1
Administering Department	Physics	College	college of science	
Module Leader	Dr. Wasan A. Al-Taa'y		e-mail	wassan.ali.mousa@nahrainuniv.edu.iq
Module Leader's Acad. Title	Assist Professor	Module Leader's Qualification	Ph.D.	
Module Tutor	Reem Yaser		e-mail	reem.yasir@nahrainuniv.edu.iq
Peer Reviewer Name	Zahraa Selman	e-mail	zehraa.salman@nahrainuniv.edu.iq	
Review Committee Approval	2023/11/22	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

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1- Understand electric charge and electric field.</li><li>2- Knowing the materials.</li><li>3- Identify the electric field of charges and electric field lines.</li><li>4- Identifying the forces, moments and electric potential energy.</li><li>5- Learn about Gauss' law ,Ohm's Law, Coulomb's law.</li><li>6- Identify the electric flux and the enclosed charge.</li><li>7-Learn about the electrostatic field.</li><li>8-Identification of a point charge inside a spherical surface.</li><li>9 - Identify the resistance and capacitance.</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<p>Make the student able to:</p> <ol style="list-style-type: none"><li>1- Understand electric charge and electric field.</li><li>2- Knowing the composition of the material.</li><li>3- Know the types of matter.</li><li>4- Know the types of electric charge.</li><li>5- Learn about Coulomb's law.</li><li>6- Identify the electric field of charges and electric field lines.</li><li>7- Identifying the forces, moments and electric potential energy.</li><li>8- Learn about Gauss' law.</li><li>9- Identify the electric flux and the enclosed charge.</li><li>10-Learn about the electrostatic field.</li><li>11-Identification of a point charge inside a spherical surface.</li><li>12- Learn about Ohm's Law.</li><li>13 - Identify the resistance and capacitance.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following. electric charge and electric field, electric charge and structure of matter, types of matter, charge is conserved, charging by induction and friction,electric forces on uncharged objects, Coulomb's law, electric field, electric field on a point charge, electric field calculations, electric field lines, electric dipole, forces, moments and electric potential energy, Gauss' law, electric flux and the enclosed charge, calculating electric flux, flux of a nonuniform electric field, point charge inside a spherical surface, the electrostatic field, Ohm's Law, resistance and capacitance, capacitor in series and parallel, inductive CCT, inductive resistance XL, capacitive reactance Xc</p>
<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<p>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 and by oral, written exams and homeworks.</p>

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	124	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	8,26
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	96	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	6.4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	220		

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

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الأسبوعي النظري	
	Material Covered
<b>Week 1</b>	electric charge, electric field, electric charge and structure of matter.
<b>Week 2</b>	types of matter, charge is conserved, charging by induction and friction
<b>Week 3</b>	electric forces on uncharged objects, Coulomb's law
<b>Week 4</b>	electric field, electric field on a point charge,
<b>Week 5</b>	electric field calculations, electric field lines,
<b>Week 6</b>	electric dipole, forces, moments and electric potential energy
<b>Week 7</b>	Causs' law, electric flux and the enclosed charge
<b>Week 8</b>	Mid exam
<b>Week 9</b>	calculating electric flux,
<b>Week 10</b>	flux of a nonuniform electric field ,
<b>Week 11</b>	point charge inside a spherical surface,

<b>Week 12</b>	the electrostatic field, Ohm's Law, resistance and capacitance,
<b>Week 13</b>	capacitor in series and parallel, inductive CCT,
<b>Week 14</b>	inductive resistance XL, capacitive reactance Xc
<b>Week 15</b>	<b>Preparatory Week</b>
<b>Week 16</b>	<b>Final Exam</b>

<b>Delivery Plan (Weekly Lab. Syllabus)</b> المنهاج الاسبوعي للمختبر	
	<b>Material Covered</b>
<b>Week 1</b>	Lab 1: Ohms law
<b>Week 2</b>	Lab 2: Ohmic and Non Ohmic materials
<b>Week 3</b>	Lab 3: Series and parallel of capacitor and energy
<b>Week 4</b>	Lab 4: Electrical resonance phenomenon
<b>Week 5</b>	Lab 5: Voltage difference for The resistance and capacitance
<b>Week 6</b>	Lab 6: Voltage and resistance for the battery
<b>Week 7</b>	Lab 7: parallel and series for resistance and equivalent resistance

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	Edward M.Purcell, Electricity and magnetism, 3 <sup>rd</sup> edition	yes
<b>Recommended Texts</b>	University physics with modern physics, 13 <sup>th</sup> edition	Yes
<b>Websites</b>		

## APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				



ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي



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## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
<b>Module Title</b>	<b>MECHANICS AND PROPERTIES OF MATTER</b>		<b>Module Delivery</b>
<b>Module Type</b>	CORE		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input checked="" type="checkbox"/> Seminar
<b>Module Code</b>	PHY-111		
<b>ECTS Credits</b>	7		
<b>SWL (hr/sem)</b>	175		
<b>Module Level</b>	1	<b>Semester of Delivery</b>	
<b>Administering Department</b>	Physics Department	<b>College</b>	Science
<b>Module Leader</b>	Dr. Ahmed A. Al-Tabbakh Reem Mozahim Taboor Ruaa Tahsen Zainab khalid	<b>e-mail</b>	<a href="mailto:ahmad.altabbak@nahrainuniv.edu.iq">ahmad.altabbak@nahrainuniv.edu.iq</a>
<b>Module Leader's Acad. Title</b>	Professor	<b>Module Leader's Qualification</b>	Ph.D.
<b>Module Tutor</b>	Dr. Omar Adnan	<b>e-mail</b>	
<b>Peer Reviewer Name</b>		<b>e-mail</b>	
<b>Review Committee Approval</b>		<b>Version Number</b>	

## Relation With Other Modules

العلاقة مع المواد الدراسية الأخرى

<b>Prerequisite module</b>	None	<b>Semester</b>	
<b>Co-requisites module</b>	None	<b>Semester</b>	

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"> <li>1. تعريف الطلاب بالمفاهيم الأساسية المتعلقة بالانظمة الساكنة والمتحركة.</li> <li>2. تعريف الطالب بطرق تصنيف الانظمة الميكانيكية والقوانين المتعلقة بها والتطبيقات الحياتية التي تحاكي نظرياتها.</li> <li>3. تعريف الطالب بطرق الحلول الرياضية للمشكلات المتعلقة بالانظمة الميكانيكية الساكنة والمتحركة.</li> </ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> <li>1. اكساب الطالب الخبرة الكافية للتعامل مع الانظمة الميكانيكية الساكنة والحركية وفق النظريات والقوانين الرياضية المنسجمة معها.</li> <li>2. تعزيز قدرة الطالب الذهنية على تحليل الانظمة الساكنة والحركية وفق تلك النظريات لايجاد الحلول المطلوبة للمشكلات التي يمكن ان يواجهها الطالب خلال الدراسة وبعد التخرج.</li> <li>3. يكون الطالب مهيباً للانتقال الى المراحل الدراسية الاخرى ودراسة مواضيع اخرى مثل فيزياء الحركة الموجية, ميكانيك الموائع و ميكانيك الكم.</li> </ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<ol style="list-style-type: none"> <li>1. مقدمة إلى المتجهات.</li> <li>2. التوازن تحت تأثير القوى المتزامنة</li> <li>3. التوازن تحت تأثير القوى المستوية</li> <li>4. الحركة المتسارعة بشكل موحد.</li> <li>5. قوانين نيوتن</li> <li>6. العمل والطاقة والقوة</li> <li>7. الدفع والزخم</li> </ol>

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<b>Strategies</b>	<ol style="list-style-type: none"> <li>1. التعليم المتمايز: محطات التعلم: يوفر التعليم المتمايز وسيلة لتلبية احتياجات جميع الطلاب. إحدى الإستراتيجيات المفيدة للتمييز بين التدريس هي محطات التعلم. يمكن تصميم محطات التعلم بسهولة لتمكين الطلاب ذوي الاحتياجات التعليمية المتنوعة من التعلم وفقاً لسرعتهم ومستوى استعدادهم. يمكن للمدرسين إعداد كل محطة حيث سيتمكن الطلاب من إكمال نفس المهمة، ولكن بالمستوى والأسلوب المصممين خصيصاً لهم.</li> </ol>
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2. التعلم التعاوني: يتيح التعلم التعاوني للطلاب الفرصة للعمل مع الآخرين ورؤية وجهات نظر مختلفة. يتعلم الطلاب بشكل أكثر فعالية عند العمل معاً بدلاً من العمل بشكل منفصل، ومن المعروف أيضاً أنه يحسن الثقة بالنفس لدى الطلاب.
3. استخدام التكنولوجيا في الفصل الدراسي. مثل الاستعانة بعروض الوسائط المتعددة و الافلام العلمية والرسومات المنتحركة التوضيحية.
4. التعلم المبني على الاستقصاء وذلك لإشراك الطلاب في التعلم من خلال طرح الأسئلة الاستقصائية والتحقيقية والاستكشافية.

### Student Workload (SWL)

#### الحمل الدراسي للطلاب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطلاب خلال الفصل	102	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطلاب أسبوعياً	7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطلاب خلال الفصل	98	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطلاب أسبوعياً	6.5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطلاب خلال الفصل	200		

### Module Evaluation

#### تقييم المادة الدراسية

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

### Delivery Plan (Weekly Lab. Syllabus)

#### المنهاج الاسبوعي للمختبر

Material Covered	
<b>Week 1</b>	مقدمة إلى المتجهات: الكمية العددية، الكمية المتجهة، المحصلة، الجمع الرسومي للمتجهات، طريقة متوازي الأضلاع، طرح المتجهات، الدوال المثلثية، مكونات المتجه، متجهات الوحدة
<b>Week 2</b>	مقدمة إلى المتجهات: حلول المسائل
<b>Week 3</b>	التوازن تحت تأثير القوى المتزامنة: القوى المتزامنة، جسم في حالة اتزان، الشرط الأول في الاتزان، طريقة حل المشكلة.

Week 4	التوازن تحت تأثير القوى المتزامنة: حل المشاكل
Week 5	التوازن تحت تأثير القوى المستوية: عزم الدوران أو الزخم، شرطان لتحقيق التوازن، ومركز الثقل
Week 6	التوازن تحت تأثير القوى المتوازنة : حلول المسائل
Week 7	<b>امتحان</b>
Week 8	الحركة المتسارعة بشكل منتظم: السرعة والسرعة والتسارع. حركة متسارعة بشكل منتظم على خط مستقيم، المقذوفات.
Week 9	الحركة المتسارعة بانتظام: حلول المسائل
Week 10	قوانين نيوتن: الكتلة، القوة، القوة الخارجية. قانون نيوتن الأول، قانون نيوتن الثاني، قانون نيوتن الثالث. قانون الجاذبية العالمية. وزن. أنواع القوات.
Week 11	قوانين نيوتن: حلول المسائل
Week 12	العمل والطاقة والطاقة: الشغل، الطاقة الحركية، طاقة الجاذبية الكامنة، حفظ الطاقة، القدرة، كيلوات/ساعة
Week 13	العمل والطاقة والطاقة: حلول المسائل
Week 14	الدفع والزخم: الزخم الخطي، الدفع يسبب تغير في الزخم، حفظ الزخم الخطي، التصادمات والانفجارات. التصادم المرن، معامل الرد.
Week 15	<b>امتحان</b>

## Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Theory and Applications of College Physics, 7th Edition By Fredrick J. Bueche	Available
Recommended Texts	Fundamentals of Physics By Halliday , Resnick and Walker	Available
Websites	<a href="http://www.youtube.com">www.youtube.com</a>	

## APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	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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<b>Fail Group (0 - 49)</b>	FX – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
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Note:				
NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				



ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي



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## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	GENERAL ASTRONOMY		Module Delivery
Module Type	CORE	<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input checked="" type="checkbox"/> Seminar	
Module Code	PHYS1112		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	1		Semester of Delivery
Administering Department	Physics	College	Science
Module Leader	Dr. Jazeel Hussein Azeez	e-mail	jazeel.azeez@nahrainuniv.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Review Committee Approval		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

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. Learn the basics of astronomy and study the laws that govern this science.</li><li>2. Identifying astronomical phenomena, their physical interpretation, and terminology related to this science.</li><li>3. Recognize the physical properties of the near and far celestial bodies and learn about the laws governing them and their movement in the sky</li><li>4. Identifying the method of observing the various astronomical phenomena and trying to explain them in a correct scientific way through the laws that govern astronomy.</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Enable students to obtain knowledge and understanding of the principles, scientific foundations, and theories of astronomy.</li><li>2. Enabling students to obtain an understanding of modern and advanced scientific topics in this field.</li><li>3. Enable the student to identify celestial bodies, including stars and interstellar matter, which contain gases and cosmic dust, as well as planets, meteorites, meteors and comets, as well as identify galaxies, which represent the basic structure of the universe. And try to explain the phenomena experienced by these objects.</li><li>4. Introducing the student to how to find and deal with the events that take place for celestial bodies and to determine their dimensions and speed, as well as dealing with their various phenomena.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	Whiteboard, LCD, and Data show.
<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<ul style="list-style-type: none"><li>• Discussing the topics of the textbook and supporting references</li><li>• Theoretical lectures including problem solving and discussion of homework</li><li>• Asking students a set of thinking questions during the lectures for specific topics.</li><li>• Giving students homework that requires finding self-solutions.</li></ul>

## Student Workload (SWL)

الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	45	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	3
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	3.46
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	100		

## Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	20% (10)	5, 10	
	<b>Assignments</b>	2	10% (10)	2, 11	
	<b>Projects / Lab.</b>				
	<b>Report</b>	2	10% (10)	14	
<b>Summative assessment</b>	<b>Midterm Exam</b>	1 hr	10% (10)	7	LO # 1-7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
<b>Week 1</b>	Introduction
<b>Week 2</b>	celestial coordinates & Kepler's laws
<b>Week 3</b>	The sun and its layers
<b>Week 4</b>	Planets of the solar system(1 - 4)
<b>Week 5</b>	Planets of the solar system(5 - 8)
<b>Week 6</b>	Meteors, meteors and comets
<b>Week 7</b>	Mid exam
<b>Week 8</b>	interstellar medium & Star Formation
<b>Week 9</b>	Main sequence stars
<b>Week 10</b>	physical properties of stars-Part 1

<b>Week 11</b>	physical properties of stars-Part 2
<b>Week 12</b>	star evolution
<b>Week 13</b>	Galaxies and Clusters
<b>Week 14</b>	Report Discussion
<b>Week 15</b>	<b>Preparatory Week</b>
<b>Week 16</b>	<b>Final Exam</b>

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

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	Fundamental Astronomy 5th edition, H. Karttunen, Springer-Verlag Berlin Heidelberg 2007.	<b>Electronic Version</b>
<b>Recommended Texts</b>	فيزياء الجو والفضاء : الجزء الاول (علم الفلك) حميد مجول النعيمي وفياض النجم : وزارة التعليم العالي والبحث العلمي العراقية، 1981	No
<b>Websites</b>		



## APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				



ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي



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



## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	INTRODUCTION TO COMPUTER SCIENCE		Module Delivery
Module Type	BASIC		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	UREQ120		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	1	Semester of Delivery	
Administering Department	physics	College	science
Module Leader	Dr. Ahmed Shakir Mahmood	e-mail	Ahmad.mohmood@nahrainuniv.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Ahmed Shakir Mahmood Bilal Abdul Satar Rasha Shahir Badawi	e-mail	Ahmad.mohmood@nahrainuniv.edu.iq Bilal.AbdulSatar@nahrainuniv.edu.iq Rasha.shahir@nahrainuniv.edu.iq
Peer Reviewer Name		e-mail	
Review Committee Approval	01/09/2024	Version Number	1.0

## Relation With Other Modules

العلاقة مع المواد الدراسية الأخرى

<b>Prerequisite module</b>	None	<b>Semester</b>	
<b>Co-requisites module</b>	None	<b>Semester</b>	

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. To give a general description to the main parts of the computer.</li><li>2. To learn the fundamentals of the visual basic programming language.</li><li>3. Develop programming skills for the students to solve different kinds of physical and mathematical problems.</li><li>4. Knowing some of the basic commands for the visual basic programming language.</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. The students will learn a lot of information about the software and hardware for the computer and how one can use it for many applications in our life.</li><li>2. Develop the knowledge of the students for the aspect of programming logic and how one can use it to solve simple problems.</li><li>3. Understanding the basic commands and objects in the visual basic programming language.</li><li>4. The students should be able to write a different programming codes to solve basic mathematical and physical problems.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p>Introduction to the hardware and software of the computer.</p> <p>The Visual Basic environment and creating the user interface by using the standard control tools.</p> <p>Some properties for the standard control tools.</p> <p>Visual Basic fundamentals, data declarations.</p> <p>Arithmetic operators.</p> <p>Commonly used library functions in Visual Basic.</p> <p>Working with controls and learning what mathematical logic means, then writing a program in visual basic programming language to solve any problem.</p> <p>The branching command.</p> <p>The Looping Command.</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	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.
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## Student Workload (SWL)

### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	60	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	15	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	1
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	75		

## Module Evaluation

### تقييم المادة الدراسية

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

## Delivery Plan (Weekly Syllabus)

### المنهاج الأسبوعي النظري

	Material Covered
<b>Week 1</b>	Introduction to the hardware and software of the computer
<b>Week 2</b>	The Visual Basic environment and creating the user interface by using the standard control tools.
<b>Week 3</b>	Some properties for the standard control tools.

<b>Week 4</b>	Visual Basic fundamentals, data declarations.
<b>Week 5</b>	Arithmetic operators.
<b>Week 6</b>	Commonly used library functions in Visual Basic-I.
<b>Week 7</b>	Commonly used library functions in Visual Basic-II.
<b>Week 8</b>	Commonly used library functions in Visual Basic-III.
<b>Week 9</b>	Working with controls and learning what mathematical logic means, then writing a program in visual basic programming language to solve any problem.
<b>Week 10</b>	<b>Mid Exam</b>
<b>Week 11</b>	The branching command –I.
<b>Week 12</b>	The branching command –II.
<b>Week 13</b>	The Looping Command -I
<b>Week 14</b>	The Looping Command -II
<b>Week 15</b>	<b>Preparatory Week</b>
<b>Week 16</b>	<b>Final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	<b>Material Covered</b>
<b>Week 1</b>	Lab 1: Introduction to the hardware and software of the computer
<b>Week 2</b>	Lab 2: The Visual Basic environment and creating the user interface by using the standard control tools.
<b>Week 3</b>	Lab 3: some properties for the standard control tools.
<b>Week 4</b>	Lab 4: Visual Basic fundamentals, data declarations.
<b>Week 5</b>	Lab 5: Arithmetic operators.
<b>Week 6</b>	Lab 6: Commonly used library functions in Visual Basic-I.
<b>Week 7</b>	Lab 7: Commonly used library functions in Visual Basic-II.
<b>Week 8</b>	Lab 8: Commonly used library functions in Visual Basic-III.
<b>Week 9</b>	Lab 9: Working with controls and learning what mathematical logic means, then writing a program in visual basic programming language to solve any problem.
<b>Week 10</b>	<b>Mid Exam</b>
<b>Week 11</b>	Lab 11: The branching command –I.
<b>Week 12</b>	Lab 12: The branching command –II.
<b>Week 13</b>	Lab 13: The Looping Command -I

<b>Week 14</b>	Lab 14: The Looping Command -II
<b>Week 15</b>	<b>Preparatory Week</b>
<b>Week 16</b>	<b>Final Exam</b>

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	“Microsoft Visual Basic 6.0 Step by Step” Microsoft Corporation (1999)	No
<b>Recommended Texts</b>	“Schaum’s Outline of Theory and Problems of Programming with Visual Basic”, by Byron S. Gottfried McGraw-Hill, NC. (2001)	No
<b>Recommended Texts</b>	Lectures Notes Dr. Ahmed Shakir Mahmood Yas (2023)	
<b>Websites</b>	<a href="https://learn.microsoft.com/en-us/previous-versions/visualstudio/visual-basic-6/visual-basic-6.0-documentation">https://learn.microsoft.com/en-us/previous-versions/visualstudio/visual-basic-6/visual-basic-6.0-documentation</a>	

#### APPENDIX:

<b>GRADING SCHEME</b> مخطط الدرجات				
<b>Group</b>	<b>Grade</b>	<b>التقدير</b>	<b>Marks (%)</b>	<b>Definition</b>
<b>Success Group (50 - 100)</b>	<b>A - Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C - Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 – 49)</b>	<b>FX – Fail</b>	مقبول بقرار	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	راسب	(0-44)	Considerable amount of work required
<b>Note:</b>				
NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				



ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي



Ministry of Higher Education and  
Scientific Research - Iraq  
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College of Sciences  
Physics Department



## MODULE DESCRIPTION FORM

### نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	<b>Calculus (I)</b>		Module Delivery
Module Type	<b>B</b>		<ul style="list-style-type: none"><li><input checked="" type="checkbox"/> Theory</li><li><input type="checkbox"/> Lecture</li><li><input type="checkbox"/> Lab</li><li><input checked="" type="checkbox"/> Tutorial</li><li><input type="checkbox"/> Practical</li><li><input type="checkbox"/> Seminar</li></ul>
Module Code	<b>CRCAL1</b>		
ECTS Credits	<b>4</b>		
SWL (hr/sem)	<b>100</b>		
Module Level		Semester of Delivery	
Administering Department	Mathematics and Computer Applications	College	College of Sciences
Module Leader	Ibtisam Kamil Hanan	e-mail	<a href="mailto:ibtisam.kamil@nahrainuniv.edu.iq">ibtisam.kamil@nahrainuniv.edu.iq</a>
Module Leader's Acad. Title	Asst. Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Ibtisam Kamil Hanan	e-mail	<a href="mailto:ibtisam.kamil@nahrainuniv.edu.iq">ibtisam.kamil@nahrainuniv.edu.iq</a>
Peer Reviewer Name	me	e-mail	E-mail



Scientific Committee Approval Date	1/9/2024	Version Number	1.0
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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	
<b>Module Aims</b> أهداف المادة الدراسية	<p>The aim of this course is for student to gain proficiency in computations. In calculus, we use two main tools for analyzing and describing the behavior of functions: limits and derivatives. Students will use these tools to solve application problems in a variety of setting ranging from physics and chemistry to business and economics.</p>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> <li>1. To determine the solution set of inequalities involving absolute value,</li> <li>2. To determine domain, range and operation of someone variable functions and the graphs.</li> <li>3. To determine limit and continuity of one variable functions.</li> <li>4. To determine derivate of one variable functions.</li> <li>5. To determine the solution of problems involving the derivate of one variable function.</li> <li>6. To determine inverse function and its derivative.</li> <li>7. To learn about application of derivatives.</li> </ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<ol style="list-style-type: none"> <li>1. Real number, inequalities, absolute value, Cartesian coordinate system, function and its graph, operation on function, trigonometry function.</li> <li>2. Definition, theorems of limit, trigonometry function limit, limit on infinity, infinite limit, continuity function,</li> <li>3. Definition and rule of derivate, derivate of trigonometry function, chain rule, higher order derivate, implicit derivate, related rate, basic concept of differential,</li> <li>4. Maximum and minimum, monotonicity and concavity, graphing one variable function, mean value theorem for derivate.</li> </ol>

	7. Natural logarithm function, inverse function and its derivate, natural exponential function, general exponential function, general logarithm function, hyperbolic function and its inverse.
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	The module will be presented to the students through a specified series of lectures, supported by problem solving practice carried out in interactive tutorials. These tutorials will be supported by practice and directed study outside the classroom. Formative assessment takes place throughout the module during tutorials and feedback is given during these tutorials.

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	48	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	3
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.467
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	100		

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

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
Week 1	The Rate of Change of Function: Coordinates, Increments and Distance, Slope of the straight line, Equations of straight lines, Circle, Equation of circle.
Week 2	Inequalities, Intervals, Absolute value, Properties of Absolute values.
Week 3	Functions and graphs: Odd function, Even function, Domain, Range, Composition function, Shift Formula, Axes intercept points, Symmetry, Asymptotes.
Week 4	Limits and continuity :Calculation Techniques of limits, One sided and two-sided limits.
Week 5	Limit at infinity, Oblique asymptote, Sandwich theorem, Continuous functions.
Week 6	The slope of the curve and derivatives: Formal differentiation, Rules of derivatives
Week 7	Mid Term Exam + Implicit differentiation, Second and higher order derivatives, Chain rule, Extended Chain rule.
Week 8	Parametric equations, Derivatives of the Parametric Equations, L'Hopital's rule (First Form), L'Hopital's rule (Stronger Form).
Week 9	Transcendental Functions: Properties and derivatives for Trigonometric functions.
Week 10	Properties and derivatives for Inverse of trigonometric functions.
Week 11	Properties and derivatives for Logarithmic, exponential functions and The exponent function $a^x$
Week 12	Properties and derivatives for (Hyperbolic functions and Inverse of Hyperbolic Functions)
Week 13	Applications of Derivatives: Curve sketching
Week 14	Roll's and mean value theorems, Velocity and acceleration.
Week 15	Preparatory Week
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	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 Geometry by Thomas	Yes
Recommended Texts	Calculus with application brief version	No
Websites	<a href="http://www.mathhandbook.com">www.mathhandbook.com</a>	

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
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	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.



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



## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

Module Information			
الدراسية المادة معلومات			
Module Title	Human Rights And Democracy	Module Delivery	
Module Type	Theory Lecture	Theory Lecture	
Module Code		<ul style="list-style-type: none"><li>• Lab</li><li>• Tutorial</li><li>• Practical</li><li>• Seminar</li></ul>	
ECTS Credits			
SWL (hr/sem)			
Module Level		Semester of Delivery	First Semester
Administering Department		College	
Module Leader	Dr. Ahmed Neama Juda	e-mail	: ahmedjuda68@gmail.com
Module Leader's Acad. Title		Module Leader's Qualification	University Doctor Assistant
Module Tutor	-	e-mail	-
Peer Reviewer Name		e-mail	
Review Committee Approval		Version Number	

**العلاقة Relation With Other Modules**  
مع المواد الدراسية الأخرى

<b>Prerequisite module</b>		<b>Semester</b>	
<b>Co-requisites module</b>		<b>Semester</b>	
<b>Module Aims, Learning Outcomes and Indicative Contents</b> الإرشادية والمحتويات التعلم ونتائج الدراسة المادة أهداف			
<b>Module Aims</b> الدراسي ة المادة أهداف	The aim of human rights and democracy lectures is to simplify the principles of human right and to assure democracy disciplines applying by equally and properly distribution among people in the society.		
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<p><b>A- Cognitive objectives:</b></p> <p><b>A1-</b> Introducing the student to the principles of human rights.</p> <p><b>A2-</b> Briefly introduce the student to the nature of human rights and freedoms and the nature of democracy and its types.</p> <p><b>A3-</b> Comprehensive knowledge of human rights and basic freedoms in light of the existing reality and types of political systems and states.</p> <p><b>A4-</b> Introducing the bullying stereotyped and the Iraqi historical performance in Iraqi governments in the ancient and modern era.</p> <p><b>B- The skills objectives of the course:</b></p> <p><b>B1 -</b> Introducing the student to human rights and freedoms and how to deal with international and regional treaties and their internal legislation.</p> <p><b>B2 -</b> Deriving knowledge related to human rights and how they are reflected and their true civilizational role in the lives of peoples.</p> <p><b>B3 -</b> Knowing how different governments and ideologies deal with human rights and democracy in practice in countries of the world.</p>		
<b>Indicative Contents</b> المحتويات الإرشادية			

<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	This is done through a booklet that was prepared by me using external sources such as books, newspapers, and the information network, through in-person lectures, and supporting this with illustrative means in Word or PDF format. It is carried out through weekly lectures and through observations made by the teacher and measuring the extent of students' knowledge.

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الفصل خلال للطالب المنتظم الدراسي الحمل		<b>Structured SWL (h/w)</b> أسبوعي للطالب المنتظم الدراسي الحمل	
<b>Unstructured SWL (h/sem)</b> خلال للطالب المنتظم غير الدراسي الحمل الفصل		<b>Unstructured SWL (h/w)</b> أسبوعي للطالب المنتظم غير الدراسي الحمل	
<b>Total SWL (h/sem)</b> الفصل خلال للطالب الكلي الدراسي الحمل			

<b>Module Evaluation</b> الدراسية المادة تقييم					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2 times	10 marks		
	<b>Assignments</b>	once	20 marks		



	<b>Seminars / Lab.</b>				
	<b>Report</b>	<b>once</b>	<b>10 marks</b>		
<b>Summative assessment</b>	<b>Midterm Exam</b>	<b>once</b>	<b>10 marks</b>		
	<b>Final Exam</b>	<b>once</b>	<b>50 marks</b>		
<b>Total assessment</b>			<b>100 marks</b>		

### Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	<b>Concepts about human rights and fundamental freedoms.</b>
<b>Week 2</b>	<b>Categories and Features of Human Rights.</b>
<b>Week 3</b>	<b>Characteristics and advantages of human rights in Islam.</b>
<b>Week 4</b>	<b>The difference between human rights and public freedoms.</b>
<b>Week 5</b>	<b>Freedom, its concept and types.</b>
<b>Week 6</b>	<b>Human rights In ancient civilizations (Mesopotamia civilization) .</b>
<b>Week 7</b>	<b>Human rights in ancient civilizations (Chinese, Hindu, Pharaonic and Greek Egypt) .</b>
<b>Week 8</b>	<b>Human rights in the heavenly religions (Christianity and Islam).</b>
<b>Week 9</b>	<b>Human rights in the Middle Ages.</b>
<b>Week 10</b>	<b>Human rights in the modern era and the international organizations responsible for implementing them.</b>
<b>Week 11</b>	<b>The concept of democracy and it's characteristics.</b>
<b>Week 12</b>	<b>Types of democracy.</b>
<b>Week 13</b>	<b>Pictures of democratic systems.</b>
<b>Week 14</b>	<b>Democratic political rights.</b>
<b>Week 15</b>	<b>Preparatory Week (Study Material review for the final exam).</b>
<b>Week 16</b>	<b>Final Exam</b>

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

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	<b>1.Universal Declaration of Human Rights (Drafting Committee of the Universal Declaration of Human Rights).</b> <b>2. Human Rights (Thomas Paine).</b> <b>3.Human rights in Islam (Ali Abdul Wahid) .</b>	<b>Not available</b>
<b>Recommended Texts</b>	<b>Human rights in the Arab world (Hussein Jameel) .</b>	<b>Not available</b>
<b>Websites</b>		

**APPENDIX:**

مخطط GRADING SCHEME الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				



ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي



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



## MODULE DESCRIPTOR

### وصف المادة الدراسية – فيزياء الذرية

Module Information			
معلومات المادة الدراسية			
<b>Module Title</b>	Modern Physics 1	<b>Module Delivery</b>	
<b>Module Type</b>	CORE	<b>Theoretical and experimental</b>	
<b>Module Code</b>	PHY23013		
<b>ECTS Credits</b>	5		
<b>SWL (hr/sem)</b>	125		
<b>Module Level</b>	UGII	<b>Semester (s) offered</b>	3
<b>Administering Department</b>	Physics	<b>College</b>	Science
<b>Module Leader</b>	Nissan soud oribi	<b>e-mail</b>	<a href="mailto:nissan.oribi@nahrainuniv.edu.iq">nissan.oribi@nahrainuniv.edu.iq</a>
<b>Module Leader's Acad. Title</b>	Asst. Prof.	<b>Module Leader's Qualification</b>	Ph.D.
<b>Module Tutor</b>	None	<b>e-mail</b>	
<b>Peer Reviewer Name</b>		<b>e-mail</b>	
<b>Review Committee Approval</b>		<b>Version Number</b>	1.0

<b>Relation With Other Modules</b> العلاقة مع المواد الدراسية الأخرى			
<b>Prerequisite module</b>	-	<b>Semester</b>	-
<b>Co-requisites module</b>	-	<b>Semester</b>	-
<b>Module Aims, Learning Outcomes, Indicative Contents and Brief Description</b> أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية مع وصف مختصر			
<b>Module Aims</b> أهداف المادة الدراسية	<input type="checkbox"/> Working on developing the quality of basic university education. <input type="checkbox"/> Preparing human cadres capable of dealing with academic scientific research methods and applications. <input type="checkbox"/> Preparing efficient cadres to meet the needs of educational institutions. <input type="checkbox"/> Providing qualified cadres in response to the needs of the environment surrounding the university. <input type="checkbox"/> Interacting with the community and providing professional scientific services and consultations. <input type="checkbox"/> Exchanging experiences and competencies with similar colleges and research centers. <input type="checkbox"/> Bringing the student to the level that qualifies him for postgraduate studies to pursue research and development in physics.		
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ul style="list-style-type: none"> <li>• The student innovates solutions and explanations for physical phenomena with some modernity and creativity.</li> <li>• The student knows the concept of practical physics and adapts to solving problems.</li> <li>• The student designs a plan to study physical vocabulary in a new way</li> <li>• Enabling students to analyze reality from a physical perspective.</li> </ul>		
<b>Indicative Contents</b> المحتويات الإرشادية	manage their time effectively in order to meet fortnightly deadlines for the completion of homework and develop appropriate coping strategies; work co-operatively and use one another as a learning resource.		
<b>Course Description</b>	This course provides students with fundamental knowledge of the atom, including its radiation, interactions with matter, and governing rules. The emphasis lies on their interpretation of the physical events associated with atomic physics.		
<b>Learning and Teaching Strategies</b>			
<b>Strategies</b>	The learning and teaching strategy is designed to: Carefully cover in lectures the necessary fundamental material and analytical techniques, and demonstrate concepts with appropriate (and, where possible practical) examples. Allow students adequate time to practice the techniques using a large number of carefully selected tutorial problems		

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	<b>79</b>	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	<b>5</b>
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	<b>71</b>	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>150</b>		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		<b>Time (hr)</b>	<b>Weight (Marks)</b>	<b>Week Due</b>	<b>Relevant Learning Outcome</b>
<b>Formative assessment</b>	<b>Quizzes</b>	4	5% (5)	1	4
	<b>Assignments</b>	2	5% (5)	15	30
	<b>Lab</b>	2	15% (15)	15	30
	<b>Tut.</b>	1	5% (5)	15	15
<b>Summative assessment</b>	<b>Midterm Exam</b>	4	20% (20)	1	4
	<b>Final Exam</b>	3	50% (50)		
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الأسبوعي النظري	
	<b>Material Covered</b>
<b>Week 1</b>	<b>The Quantum Theory Of Light</b> Introduction to the atomic ,What is atomic physics and atomic structure , Atomic mass, Avogadro number.The nature of light and electromagnetic radiation, Thermal Radiation, Emission and Absorption of Radiation
<b>Week 2</b>	, Electron configuration , The electron orbital diagrams, Shell and subshell of orbital, Atomic mass unit and determination of e/m
<b>Week 3</b>	Atomic model,
<b>Week 4</b>	<b>Atomic spectra</b> Divination of the Atomic spectra , Absorption spectrum, emission spectrum , and X-ray
<b>Week 5</b>	quantum theory :blackbody radiation and plank radiation law Wien's distribution law, Rayleigh-Jeans' law, Home Work, Planck's Law of Radiation, Derivation Wien's law from Planck's law , Derivation of Rayleigh-Jeans' law from Planck's law, Derivation of Stefan's Law from the Planck Distribution, Photoelectric Effect,
<b>Week 6</b>	<b>Monthly Exam.</b>

<b>Week 7</b>	The Bohr Atom, Spectral Series, Bohr's Quantum Model of the Atom, Energy levels and spectra. Hydrogen atom spectrum
<b>Week 8</b>	Atomic excitation: The Franck–Hertz Experiment, Bohr's Correspondence Principle,
<b>Week 9</b>	Behr's solution of Hydrogen
<b>Week 10</b>	Elliptic orbital for Hydrogen atom Home work.
<b>Week 11</b>	Selection rule and spectral notation Hydrogen and sodium
<b>Week 12</b>	Zeeman effect
<b>Week 13</b>	<b>Atomic Structure</b> Orbital Magnetism and the Normal Zeeman Effect, The Spinning electron, the lande g factor
<b>Week 14</b>	The spin–orbit interaction and other magnetic effect, Exchange Symmetry and the Exclusion Principle, The Periodic Table.
<b>Week 15</b>	<b>Monthly Exam</b>

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي العملي	
	Material Covered
<b>Week 1</b>	<b>Inverse square law</b>
<b>Week 2</b>	Daily exam and discussion reports
<b>Week 3</b>	<b>Thermal radiation</b>
<b>Week 4</b>	Daily exam and discussion reports
<b>Week 5</b>	<b>Determination of Rydberg constant .</b>
<b>Week 6</b>	Daily exam and discussion reports
<b>Week 7</b>	<b>Calibration of a linear spectrum</b>
<b>Week 8</b>	Monthly exam.
<b>Week 9</b>	Frank-Hertz experiment
<b>Week 10</b>	Daily exam and discussion reports
<b>Week 11</b>	<b>Characteristic X-rays of copper and diffraction from</b>
<b>Week 12</b>	Daily exam and discussion reports
<b>Week 13</b>	Stefan Boltzmann's radiation law experiment
<b>Week 14</b>	Photoelectric effect experiment
<b>Week 15</b>	<b>Monthly Exam</b>

## Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	<ol style="list-style-type: none"><li>1. Modern Physics (V H Satheeshkumar)</li><li>2. Atomic Physics 1<sup>st</sup> and 2<sup>nd</sup> .</li><li>3. Modern Physics 3<sup>rd</sup> (Raymond A. Serway)</li><li>4. Models of the Atomic Nucleus 2<sup>nd</sup> (Norman D. Cook)</li></ol>	yes
<b>Recommended Texts</b>	<ol style="list-style-type: none"><li>1. Solid State Physics 1st (Yahya Nouri Al-Jamal)</li><li>2. Solid State Physics 2nd (Yahya Nouri Al-Jamal)</li><li>3. Articles from internet about the subjects</li></ol>	yes
<b>Websites</b>	<p><a href="https://www.academia.edu/">https://www.academia.edu/</a> <a href="https://www.researchgate.net/">https://www.researchgate.net/</a> <a href="https://scholar.google.com/">https://scholar.google.com/</a></p>	



# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	<b>حرارة وثرموداينمك</b> <b>Heat and Thermodynamics</b>		Module Delivery
Module Type	<b>C</b>		<ul style="list-style-type: none"><li><input checked="" type="checkbox"/> Theory</li><li><input type="checkbox"/> Lecture</li><li><input checked="" type="checkbox"/> Lab</li><li><input checked="" type="checkbox"/> Tutorial</li><li><input type="checkbox"/> Practical</li><li><input type="checkbox"/> Seminar</li></ul>
Module Code	<b>PHYS2109</b>		
ECTS Credits	<b>5</b>		
SWL (hr/sem)	<b>125</b>		
Module Level	<b>2</b>	Semester of Delivery	
Administering Department	<b>PHYS</b>	College	<b>Sciences</b>
Module Leader	<b>Dr. Sadeem Abbas Fadhil</b>	e-mail	<b>sadeemfadhil@yahoo.com</b>
Module Leader's Acad. Title	<b>Assistant Professor</b>	Module Leader's Qualification	<b>Ph.D.</b>
Module Tutor	<b>Ass. Lect. Hala Fadhil Abbas (Lab's Person in charge)</b> <b>Lect. Dr. Rawasi Ayad Mohammed</b> <b>Lect. Dr. Fatima Mikdad Ahmed</b>	e-mail	

Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	21/9/2024	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	
<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"> <li>1. Understand Fundamental Concepts: Grasp basic principles such as temperature, heat, work, and the laws of thermodynamics.</li> <li>2. Apply the Laws of Thermodynamics: Learn how to use the first, second, and third laws to analyze energy transfer and conversions in various systems.</li> <li>3. Analyze Thermodynamic Cycles: Study and evaluate different thermodynamic cycles (e.g., Carnot, Rankine, and Brayton cycles) to understand their efficiency and applications.</li> <li>4. Calculate Heat Transfer: Develop skills in calculating heat transfer through conduction, convection, and radiation, and understand the factors influencing each process.</li> <li>5. Understand Phase Changes: Learn the principles behind phase transitions (e.g., melting, boiling) and how they relate to energy transfer.</li> <li>6. Explore Real-World Applications: Connect thermodynamic concepts to practical applications in engines and refrigerators.</li> </ol>

	<ol style="list-style-type: none"> <li>7. <b>Solve Thermodynamic Problems:</b> Build problem-solving skills to tackle numerical and conceptual problems in thermodynamics.</li> <li>8. <b>Use Thermodynamic Tables and Diagrams:</b> Become proficient in using steam tables, Mollier diagrams, and other resources for real fluid properties.</li> <li>9. <b>Grasp Entropy and Irreversibility:</b> Understand the concept of entropy, its implications for system efficiency, and the nature of irreversible processes.</li> <li>10. <b>Integrate with Other Fields:</b> Recognize how thermodynamics intersects with other scientific disciplines, such as chemistry, physics, and engineering.</li> </ol>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. <b>Conceptual Understanding:</b> Explain the fundamental concepts of heat and thermodynamics, including temperature, heat transfer, and the laws of thermodynamics.</li> <li>2. <b>Application of Laws:</b> Apply the first, second, and third laws of thermodynamics to solve problems involving energy transfer and conversion in various systems.</li> <li>3. <b>Cycle Analysis:</b> Analyze and evaluate thermodynamic cycles, such as the Carnot, and calculate their efficiencies.</li> <li>4. <b>Heat Transfer Calculations:</b> Perform calculations related to heat transfer processes (conduction, convection, and radiation) and apply relevant equations and principles.</li> <li>5. <b>Phase Change Insights:</b> Describe the mechanisms of phase changes and calculate the heat involved in phase transitions using latent heat concepts.</li> <li>6. <b>Real-World Application:</b> Demonstrate the application of thermodynamic principles in real-world scenarios, such as engines and refrigeration systems.</li> <li>7. <b>Problem-Solving Skills:</b> Develop problem-solving strategies to approach and resolve numerical and conceptual thermodynamics problems effectively.</li> <li>8. <b>Utilization of Resources:</b> Use thermodynamic tables, charts, and software tools to retrieve and interpret properties of substances in various states.</li> <li>9. <b>Entropy and Irreversibility:</b> Understand and explain the concept of entropy, its significance in thermodynamic processes, and the nature of irreversible processes.</li> <li>10. <b>Interdisciplinary Connections:</b> Identify and describe how thermodynamics relates to other scientific and engineering fields, including chemistry, physics, and mechanical engineering.</li> </ol>
<p><b>Indicative Contents</b></p>	<ol style="list-style-type: none"> <li>1. Introduction to Thermodynamics Definition and scope of thermodynamics</li> </ol>

<p>المحتويات الإرشادية</p>	<p>Historical background and development</p> <p>2. Basic Concepts</p> <p>Temperature and heat</p> <p>Work and energy</p> <p>Systems and surroundings: open, closed, and isolated systems</p> <p>State functions and path functions</p> <p>3. Laws of Thermodynamics</p> <p>First Law: Law of energy conservation</p> <p>Internal energy, work, and heat transfer</p> <p>Applications and problem-solving</p> <p>Second Law: Entropy and spontaneity</p> <p>Heat engines and refrigerators</p> <p>Carnot cycle and efficiency</p> <p>Third Law: Absolute zero and entropy</p> <p>4. Thermodynamic Properties of Substances</p> <p>Ideal gases and real gases</p> <p>Phase diagrams and critical points</p> <p>Property tables and charts</p> <p>5. Heat Transfer Mechanisms</p> <p>Conduction: Fourier's law and applications</p> <p>Convection: Types and calculations</p> <p>Radiation: Stefan-Boltzmann law and blackbody radiation</p> <p>6. Thermodynamic Cycles</p> <p>Carnot cycle</p> <p>Rankine cycle</p> <p>Brayton cycle</p> <p>Refrigeration cycles</p> <p>7. Phase Changes and Thermodynamics</p> <p>Latent heat and phase transitions</p> <p>Clausius-Clapeyron equation</p> <p>Practical applications of phase changes</p> <p>8. Entropy and Irreversibility</p> <p>Understanding entropy</p> <p>Entropy changes in various processes</p> <p>Reversible vs. irreversible processes. [32 hrs]</p> <p>Revision problem classes. [7 hrs]</p> <p>Experimental hours. [39hrs]</p> <p>Electronic classes [3 hrs]</p> <p>Assignments [ 10 hrs]</p>
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## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	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.
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## Student Workload (SWL)

### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	75	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

## Module Evaluation

### تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	1 <sup>st</sup> law of thermodynamics
Week 2	The state equation
Week 3	Adiabatic processes
Week 4	Test 1
Week 5	Specific Heat Capacity
Week 6	Specific Heat Capacity in Adiabatic Processes.
Week 7	Mid-term exam
Week 8	Work and Heat relationship
Week 9	2 <sup>nd</sup> Law of Thermodynamics
Week 10	Carnot cycle Thermal Machines and Refrigerators
Week 11	Solving problems
Week 12	3 <sup>rd</sup> Law of Thermodynamics
Week 13	Solving problems
Week 14	Applications of thermodynamics
Week 15	Discussing Reports

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab1 : Measurement of thermal conductivity by lees disc method
Week 2	Lab 2:Coefficient of linear expansion copper
Week 3	Lab 3: the specific heat capacity of copper by calendar method
Week 4	Lab 4:Entropy of system
Week 5	Lab 5:Determination of apparent volume expansion coefficient using density flask(D.F)
Week 6	Lab 6:Experiment to measure specific heat capacity of liquid by method cooling
Week 7	Lab 7:Determination of apparent volume expansion coefficient using density flask(D.F)

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Thermodynamics, the Kinetic Theory of Gases, and Statistical Mechanics by Francis Weston Sears	Yes
Recommended Texts	Heat and Thermodynamics, by Mark W. Zemansky, MaGraw Hill, 1968. الحرارة والثرموداينيك تأليف د. سعيد خضر وأمنة احمد رمزي، جامعة بغداد.	No

<b>Websites</b>	Any learning site on heat and thermodynamics
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<b>Grading Scheme</b> مخطط الدرجات				
<b>Group</b>	<b>Grade</b>	<b>التقدير</b>	<b>Marks (%)</b>	<b>Definition</b>
<b>Success Group (50 - 100)</b>	<b>A - Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C - Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	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.



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



## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	ANALOG ELECTRONICS		Module Delivery	
Module Type	CORE		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code				
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	second	Semester of Delivery		First
Administering Department	Physics	College	Alnahrain university	
Module Leader	Dr. Zainab M. Kubba		e-mail	Zainab.kubba@nahrainuniv.edu.iq
Module Leader's Acad. Title	Professor assistant	Module Leader's Qualification	Ph.D	
Module Tutor	Dr. Zainab M. Kubba Raghad saad Wesam mohammad Reem mozahim Reem Yasser		e-mail	<a href="mailto:Zainab.kubba@nahrainuniv.edu.iq">Zainab.kubba@nahrainuniv.edu.iq</a> <a href="mailto:Raghad.saad@nahrainuniv.edu.iq">Raghad.saad@nahrainuniv.edu.iq</a>
Peer Reviewer Name			e-mail	
Review Committee Approval			Version Number	



## Relation With Other Modules

العلاقة مع المواد الدراسية الأخرى

<b>Prerequisite module</b>	None	<b>Semester</b>	
<b>Co-requisites module</b>	None	<b>Semester</b>	

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. To study electronics and immediately starts training in this specialty, thus providing motivation</li><li>2. Is concerned with the operation, characteristics, parameters, limitations and applications of electronic devices.</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Enable students to understand how the JFET ,MOSFET and operational amplifier</li><li>2. Enable students to know the uses of each of the JFET ,MOSFET and operational amplifier</li><li>3. Enabling students to identify transistor bias methods and types of amplifiers</li><li>4. Enabling students to solve problems reducing the size of the electronic circuit</li><li>5. Enabling students to solve problems related to reducing the costs of electronic circuits</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<ol style="list-style-type: none"><li>1. Common Emitter configuration</li><li>2. Common emitter Amplifier</li><li>3. JFET</li><li>4. Operational Amplifier</li><li>5. Operational Amplifier Applications</li></ol>

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<b>Strategies</b>	<p>Learning analog electronics can be a challenging but rewarding journey if you take the following steps into consideration:</p> <ol style="list-style-type: none"><li>1. Start with basic Physics</li><li>2. Study basic components</li><li>3. Embrace a practical learning approach</li><li>4. Safety</li><li>5. Learn how to troubleshoot and learn from mistakes</li></ol>
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## Student Workload (SWL)

الحمل الدراسي للطلاب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطلاب خلال الفصل	79	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطلاب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطلاب خلال الفصل	46	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطلاب خلال الفصل	125		

## Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	<b>Assignments</b>	2	10% (10)	4, 12	LO # 3, 4, 6 and 7
	<b>Projects / Lab.</b>	1	15% (15)	Continuous	
	<b>Report</b>	1	5%	11	
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (15)	5,13	LO # 1-4, Lo#6-12
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Semiconductor Material Diode Characteristics
<b>Week 2</b>	Operation of Bipolar Transistor
<b>Week 3</b>	Common Emitter Configuration
<b>Week 4</b>	Voltage Divider Bias
<b>Week 5</b>	Dc operating point , AC equivalent circuit
<b>Week 6</b>	Common Emitter Amplifier & Frequency Response
<b>Week 7</b>	Exam

<b>Week 8</b>	JFET
<b>Week 9</b>	MOSFET
<b>Week 10</b>	Differential Amplifier
<b>Week 11</b>	Exam
<b>Week 12</b>	Op. Amp. Characteristics
<b>Week 13</b>	Op. Amp. As Comparator Op. Amp. Adder Op. Amp. Integrator
<b>Week 14</b>	Op. Amp. Differentiator
<b>Week 15</b>	<b>Preparatory Week</b>
<b>Week 16</b>	<b>Final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	Lab 1: Introduction
<b>Week 2</b>	Lab 2: P-N Junction diode characteristics Junction ideality factor
<b>Week 3</b>	Lab 3: Com. emitter configuration
<b>Week 4</b>	Lab 4: Voltage divider biasing
<b>Week 5</b>	Lab 5: Common Emitter Amplifier
<b>Week 6</b>	Lab 6: JFET
<b>Week 7</b>	Lab 7: MOSFET
<b>Week 8</b>	Lab 8: Exam
<b>Week 9</b>	Lab 9: Differential Amplifier
<b>Week 10</b>	Lab 10: Operational amplifier principles
<b>Week 11</b>	Lab 11: Operational amplifier as comparator
<b>Week 12</b>	Lab 12: Operational amplifier as summing amplifier
<b>Week 13</b>	Lab 13: Operational amplifier as differentiator and integrator
<b>Week 14</b>	Lab 14: Review
<b>Week 15</b>	Lab 15: Final Exam

## Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Electronic Devices, Thomas L. Floyd, 7th edition, Pearson Education international, 2005. • Electronic Devices, Tocci, 3rd edition, Charles E. Merrill Publishing Company, 1983. •	Yes
<b>Recommended Texts</b>	Electronic Devices, Thomas L. Floyd, 2nd edition, Merrill's International. • Microelectronics, Jacob Millman & Arivin Grabel, 2nd edition, McGraw-Hill Inc., 1987.	Yes
<b>Websites</b>		

### APPENDIX:

#### GRADING SCHEME

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	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
<b>Fail Group (0 - 49)</b>	FX - Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F - Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.



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



## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	MATHEMATICS 3 (DIFFERENTIAL EQUATIONS)		Module Delivery
Module Type	CORE	<input type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code			
ECTS Credits	4		
SWL (hr/sem)	3		
Module Level	Second Year		
Administering Department	Mathematics	College	Sciences
Module Leader	Dr. Ahmed Ayyoub Yousif	e-mail	ahmed.ayyoub@nahrainuniv.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Ahmed Ayyoub Yousif	e-mail	ahmed.ayyoub@nahrainuniv.edu.iq
Peer Reviewer Name	Dr. Fadhel S. Fadhel	e-mail	fadhel.subhi@nahrainuniv.edu.iq
Review Committee Approval		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

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. The student knows the Classifications of differential equations (ordinary and partial).</li><li>2. The student knows how to solve a differential equation (ordinary and partial) of first and higher order.</li><li>3. The student knows the applications of differential equation (ordinary and partial) in physics.</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. The student will gain experience in dealing with any life problems that have been done using partial differential equations</li><li>2. Gaining experience in solving many physical problems, especially since most of them are represented by ordinary and partial differential equations.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>The indicative contents of differential equation divided into two part: First part is about ordinary differential equations which contents:</p> <ul style="list-style-type: none"><li>- Introduction and classification of ordinary differential equations.</li><li>- First Order Differential Equations.</li><li>- Method of finding the solution of ordinary differential equations.</li><li>- General Solution of Homogeneous Linear Differential Equations.</li><li>- Linear Equations with Constant Coefficients.</li><li>- Non-Homogeneous Equations with Constant Coefficients.</li></ul> <p>Second part is about partial differential equations which contents:</p> <ul style="list-style-type: none"><li>- Introduction to Partial Differential Equations.</li><li>- Diffusion-Type Problems (Parabolic Equations).</li><li>- Separation of Variables.</li><li>- Transforming Nonhomogeneous BCs into Homogeneous Ones.</li><li>- Transforming Hard Equations into Easier Ones.</li><li>- Solving Nonhomogeneous PDEs (Eigenfunction Expansions).</li><li>- The One-Dimensional Wave Equation (Hyperbolic Equations).</li><li>- The Finite Vibrating String (Standing Waves).</li><li>- First-Order Equations (Method of Characteristics).</li></ul> <p>At last give some physical applications of differential equations.</p>
<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<ol style="list-style-type: none"><li>1. Daily activity</li><li>2. Complete the duties</li></ol>

## Student Workload (SWL)

### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	45	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	3
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	55	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	3.6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	100		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	20% (20)	5, 10	LO #1, 2, 10 and 11
	<b>Assignments</b>	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	<b>Projects / Lab.</b>	0	0% (0.0)	-	
	<b>Report</b>	1	10% (10)	13	LO # 5, 8 and 10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-7
	<b>Final Exam</b>	2hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الأسبوعي النظري

	Material Covered
<b>Week 1</b>	Classification of ODE's, First Order Differential Equations
<b>Week 2</b>	Method of Finding the Solution of First Order Differential Equations [Method 1,2]
<b>Week 3</b>	Method 3,4
<b>Week 4</b>	Method 5,6,7
<b>Week 5</b>	Linear Differential Equations, General Solution of Homogeneous Equations
<b>Week 6</b>	Linear Equations with Constant Coefficients
<b>Week 7</b>	Non-Homogeneous Equations with Constant Coefficients (Method of Undetermined Coefficients, Inspection Method), Some Physical Applications.
<b>Week 8</b>	Introduction to Partial Differential Equations, Diffusion-Type Problems (Parabolic Equations)
<b>Week 9</b>	Separation of Variables
<b>Week 10</b>	Transforming Nonhomogeneous BCs into Homogeneous Ones



<b>Week 11</b>	Transforming Hard Equations into Easier Ones, Solving Nonhomogeneous PDEs (Eigenfunction Expansions)
<b>Week 12</b>	The One-Dimensional Wave Equation (Hyperbolic Equations)
<b>Week 13</b>	The Finite Vibrating String (Standing Waves)
<b>Week 14</b>	First-Order Equations (Method of Characteristics)
<b>Week 15</b>	<b>Preparatory Week</b>
<b>Week 16</b>	<b>Final Exam</b>

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

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	<ul style="list-style-type: none"> <li>- Elementary Differential Equations By Earl D. Rainville, Phillip E. Bedient, Richard E. Bedient.</li> <li>- Partial differential equations for scientists and engineers By Stanley J. Farlow.</li> </ul>	yes
<b>Recommended Texts</b>	<ul style="list-style-type: none"> <li>- Ordinary and Partial Differential Equations By M. D. Raisinghania</li> </ul>	No
<b>Websites</b>		

## APPENDIX:

GRADING SCHEME				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group</b> (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
<b>Fail Group</b> (0 - 49)	FX – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				



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



MODULE DESCRIPTOR FORM  
نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	PROGRAMMING 3		Module Delivery
Module Type	CORE		<input type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	PHYS2104		
ECTS Credits	8		
SWL (hr/sem)			
Module Level	Second	Semester of Delivery	
Administering Department	Physics Department	College	College of Science
Module Leader	Dr. Omar Ayad	e-mail	<a href="mailto:omar.jalal@nahrainuniv.edu.iq">omar.jalal@nahrainuniv.edu.iq</a>
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Doctor
Module Tutor	Dr. Omar Ayad	e-mail	<a href="mailto:omar.jalal@nahrainuniv.edu.iq">omar.jalal@nahrainuniv.edu.iq</a>
Peer Reviewer Name		e-mail	
Review Committee Approval		Version Number	

<b>Relation With Other Modules</b> العلاقة مع المواد الدراسية الأخرى			
<b>Prerequisite module</b>	Programming 4	<b>Semester</b>	Second
<b>Co-requisites module</b>	None	<b>Semester</b>	
<b>Module Aims, Learning Outcomes and Indicative Contents</b> أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"> <li>1. Teaching students the basics of the MATLAB language.</li> <li>2. Teaching students to write advanced MATLAB programs.</li> <li>3. Teaching the student to solve some physics problems using the MATLAB language.</li> </ol>		
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> <li>1. Discussing the topics of the methodological book and auxiliary references</li> <li>2. Theoretical lectures including problem solving and discussion of homework</li> <li>3. Asking students for a set of thinking questions during lectures on specific topics.</li> <li>4. Giving students homework that requires finding solutions on their own.</li> </ol>		
<b>Indicative Contents</b> المحتويات الإرشادية	<ul style="list-style-type: none"> <li>• Daily tests 10%</li> <li>• Monthly exams 80%</li> <li>• Homework assignments and student interaction in discussion sessions 10%</li> </ul>		
<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم			
<b>Strategies</b>	<ul style="list-style-type: none"> <li>• Discussing the topics of the methodological book and auxiliary references</li> <li>• Theoretical lectures including problem solving and discussion of homework</li> <li>• Asking students for a set of thinking questions during lectures on specific topics.</li> <li>• Giving students homework that requires finding solutions on their own.</li> </ul>		

## Student Workload (SWL)

الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	102	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	6.5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	200		

## Module Evaluation

تقييم المادة الدراسية

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

## Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
<b>Week 1</b>	Introduction
<b>Week 2</b>	MATLAB work space
<b>Week 3</b>	Simple Mathematics
<b>Week 4</b>	About Variables
<b>Week 5</b>	Comment and Punctuation
<b>Week 6</b>	Complex Numbers
<b>Week 7</b>	Common Mathematical function
<b>Week 8</b>	Simple Array
<b>Week 9</b>	Array Construction

Week 10	Array Addressing
Week 11	Array Manipulation
Week 12	Sets of Linear Equations
Week 13	Relational Operators
Week 14	Logical Operators
Week 15	Preparatory Week
Week 16	Final Exam

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction
Week 2	Lab 2: MATLAB work space
Week 3	Lab 3: Simple Mathematics
Week 4	Lab 4: About Variables
Week 5	Lab 5: Comment and Punctuation
Week 6	Lab 6: Simple Array
Week 7	Lab 7: Array Construction

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	ESSENTIAL MATLAB (For Engineers and Scientists), 3 <sup>rd</sup> edition (2007), Brain D. Hahan <i>and</i> Danial T. Valentine.	
Recommended Texts	Getting Started with MATLAB 7, The MathWorks (2007). MATLAB Primer (Seventh Edition 2005), Timothy A. Davies <i>and</i> Kermit Sigmon.	
Websites	www.mathwork.com	

## APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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العاملين في المختبر:

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