

Ministry of Higher Education and Scientific  
Research

Scientific Supervision and Evaluation Authority

Quality Assurance and Academic Accreditation  
Department



**Description of Academic Programs**  
**University of Hillah**  
**College of Science**  
**Department of Forensic Sciences**

2026



University Name: University of Hillah

College/Institute: College of Science

Scientific Department: Forensic Sciences

Name of Academic or Professional Program: Bachelor of Forensic Sciences

Name of Final Certificate: Bachelor of Forensic Sciences

Study System: Semester - Bologna Track

Date of Preparation of Description 1/10/2025


Date of Filling Out the File: 15/10/2025

The File was Reviewed by the Quality Assurance and University Performance Division

Name of the Head of the Quality Assurance and University Performance Division:


Date 30/3/2026

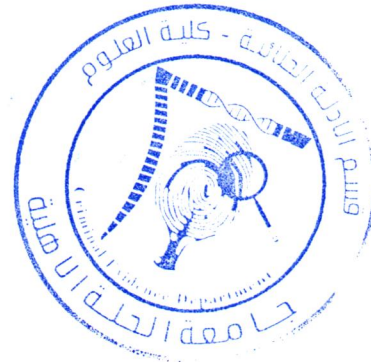
Signature

  
Ali Hussien



Approval of the Dean

  
31/3/2026



## 1. Vision

Preserving evidence at the crime scene, taking samples from its location, documenting evidence, and learning how to deal with modern equipment and technologies in the field of specialization, preventing and identifying the occurrence of crime, and supporting courts and prosecutors working with investigations Based on forensic evidence Prepare specialized cadres that contribute to raising the efficiency of the work and performance of the judicial and justice authorities, relying on scientific methods and capable of using modern equipment, techniques and methods in analyzing and documenting evidence and investigations that support the achievement of justice in society

## 2. Program mission

Provide and prepare individuals with high scientific competence in the fields of crime investigation and criminal investigations, raising fingerprints, collecting evidence, dealing with it and analyzing it, which leads to the diagnosis of perpetrators on scientific bases that do not accept ambiguity

## 3. Program objectives

Empowering students with theoretical and practical aspects in biological, physical, chemical and other medical sciences related to forensic sciences.

•Students' familiarity with the scientific and practical skills necessary to collect information, capture criminal evidence, deal with it and analyze it in forensic science laboratories using modern scientific methods

Enabling students to apply the correct mechanisms in dealing with the crime scene and using modern scientific methods within the laws and legislation followed locally and internationally

Training students to analyze evidence and link it to uncover the criminal and write reports and develop their communication and presentation skills

Realizing the importance of scientific research and technological development in the field of forensic science and preparing students to communicate with the latest developments in this field

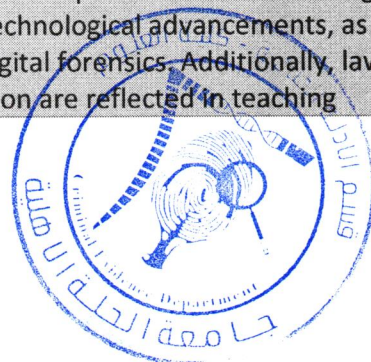
Realizing the relationship between crime and society as a whole and personal and psychological matters and familiarity with police and legal procedures related to crime and commitment to professional ethics

## 4. Programmatic accreditation

The program does not have any accreditation

## 5. External influences

The forensic science department program is influenced by a range of external factors beyond the department itself, yet these factors have a direct impact on curriculum design and educational objectives. These include scientific and technological advancements, as well as the emergence of new fields such as cybercrime and digital forensics. Additionally, laws and regulations play a crucial role; any changes in legislation are reflected in teaching



methods and professional ethics.

## 6. Program Structure

Program Structure	Number of Courses	Credit Hours	Percentage	*Notes
Institutional Requirements	11	32	%13	Suport
College Requirements	13	38	%15	Basic
Department Requirements	27	168	%70	Core
Summer Training	3			
Other	1	4	%2	



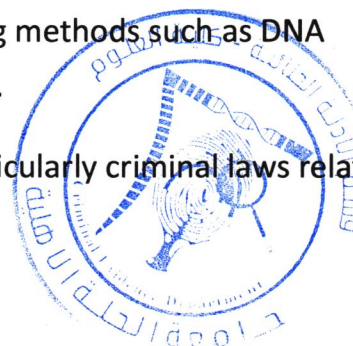
### **Academic Program Objectives:**

- The goal of the program is to graduate a cadre that possesses scientific and practical skills in uncovering evidence.
- The program is designed to provide investigators with the necessary competencies to keep pace with rapid developments in the field. It aims to provide them with the necessary skills to develop expertise and deal with crimes and uncover evidence.
- The program is designed to provide students with the scientific and practical skills necessary to diagnose and uncover facts and achieve justice.
- Work to enhance performance standards, including the application of international standards in the field of education.
- Keeping pace with developments in curricula
- Strengthening links between the department and various segments of society
- Openness and communication with similar scientific institutions inside and outside the country.

### **A- Cognitive objectives**

The program aims to enable students to:

1. Understand the theoretical foundations of forensic science and its branches.
2. Acquire knowledge of supporting sciences, and develop skills in evidence analysis and laboratory interpretation of results.
3. Understand crime scene procedures, including the steps of evidence collection and preservation.
4. Apply scientific analysis to evidence, including methods such as DNA analysis, fingerprint examination, and toxicology.
5. Gain knowledge of laws and regulations, particularly criminal laws related to forensic evidence.



6. Understand the ethics of forensic work and adhere to principles of objectivity and accuracy.

### **B- Program qualification objectives:**

The program seeks to:

1. Prepare a specialized professional workforce in the fields of forensic science and criminal analysis.
2. Apply scientific knowledge in practical settings and solve criminal cases using accurate scientific methods.
3. Practice forensic work in accordance with ethical and legal standards.
4. Develop the ability to adapt to advancements in the field.

### **Teaching and learning methods**

Theoretical lectures, practical laboratories, scientific seminars and training courses.

### **Evaluation methods**

- 1Scientific discussion, oral dialogue, semester and final exams.
- 2Study sessions (seminars).
- 3Homework.
- 4Practical activities and case studies.
- 5Writing and submitting reports and taking notes on the medical experiences gained during field visits and summer training.
- Proficiency tests to determine the level of the learner's acquisition of information and skills in a previously learned subject through his answers to questions and paragraphs that represent the content of the subject

### **Affective and value objectives**

Aim to have the student acquire a set of knowledge, skills and values that the student acquired after successfully completing the academic program. The



learning outcomes for each course must be determined in a way that achieves the program's objectives.

#### **T- Personal development planning**

Developing students' abilities to share ideas and strategies used by the faculty member to develop student teaching and learning. These are plans that are followed to achieve learning objectives. That is, describing all classroom and extracurricular activities to achieve the learning outcomes of the program

Admission criteria

- Graduates of the sixth preparatory course for the biological and applied branches



# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Molecular Biology	Module Delivery	
Module Type	Core	<input checked="" 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	FOR24119		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level			
Administering Department	FORN	College	SC
Module Leader	Ruqaya Yahya Abd AL-Shaheed	e-mail	ruqayyah_yahya@hilla-unc.edu.iq
Module Leader's Acad. Title	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	1/3/2026	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

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"><li>1. This module aims to provide a strong foundation in molecular biology and biochemistry that will be built upon in subsequent modules.</li><li>2. Core biological molecules will be examined with a focus on their structure and function.</li><li>3. Teaching will be delivered using a combination of lectures, workshops and practicals.</li><li>4. Problem solving and quantitative skills will be developed through complementary workshops using case studies, applications and examples based on lecture content.</li><li>5. Experience of biochemical techniques such as chromatography and enzyme kinetics will be gained through practicals.</li><li>6. The module will be assessed by an open exam at the end of the module.</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<p>Students who successfully complete this module will be able to:</p> <ol style="list-style-type: none"><li>1. Describe the main chemical components of cells, their structural properties, how these relate to their functions, and how they are altered during cellular processes</li><li>2. Explain theoretical frameworks (such as Michaelis Menten kinetics, the laws of thermodynamics and the chemiosmotic theory) that allow us to understand function of biological molecules and cells</li><li>3. Integrate knowledge about heterotrophic metabolism of carbohydrates &amp; lipids and phototrophic metabolism and how they relate to energy metabolism via ATP</li><li>4. Relate knowledge of biological molecules to health and disease and to their application in biotechnology</li><li>5. Analyse and evaluate enzyme kinetics data</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>The information on this page is indicative of the module that is currently on offer. The University is constantly exploring ways to enhance and improve its degree programmes and therefore reserves the right to make variations to the content and method of delivery of modules, and to discontinue modules, [20h] if such action is reasonably considered to be necessary by the University. Where appropriate, the University will notify and consult with affected students in advance about any changes</p>

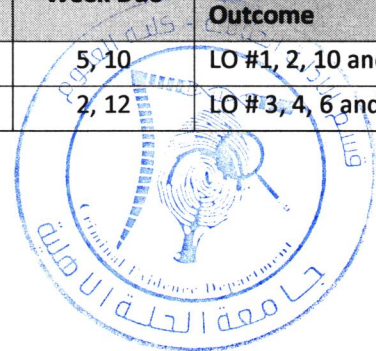


	<p>that are required in line with the University's policy on the Approval of Modifications to Existing Taught Programmes of Study[40h].</p> <p>Developed and demonstrated time management and organisational skills</p> <p>Developed skills at interpreting and retrieving information[20h] (knowledge management) and be able to demonstrate this in examinations</p> <p>Developed, and be able to apply, problem-solving skills</p> <p>Developed, and be able to demonstrate in examinations, written communication skills[15].</p>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<p>Molecular biology skills can help you work in many scientific fields, such as food science, biotechnology, forensics and more. In this article, we discuss the definition of molecular biology skills, the types of skills to include on your resume and strategies for developing molecular biology skills.</p>

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	86	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	6.1
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	89	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	6.3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	175		

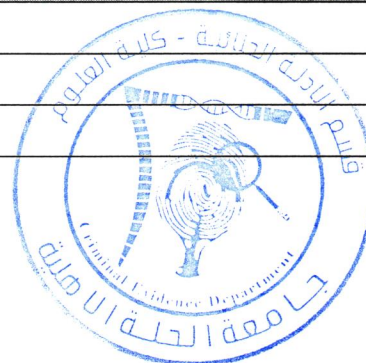
<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	<b>Assignments</b>	2	10% (10)	2, 12	LO # 3, 4, 6 and 7



	Projects / Lab.	1	10% (10)	Continuous	
	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 and brief historical review
Week 2	Experiments to prove DNA is the genetic material
Week 3	The second evidence using virus (phage) model
Week 4	DNA and RNA as macromolecules: base structure and rules
Week 5	Eukaryotic and prokaryotic DNA
Week 6	Chemical and physical properties of DNA: the hyperchromic effect
Week 7	Haploid chromosome
Week 8	Chromatin organization and chromosome structure
Week 9	DNA replication
Week 10	DNA repair pathways
Week 11	RNA structure and function
Week 12	RNA transcription and post transcription events
Week 13	Translation: protein synthesis
Week 14	Epigenetics
Week 15	Exam
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Preparation of buffers
Week 2	Lab 2: Laboratory safety rules
Week 3	Lab 3: DNA extraction



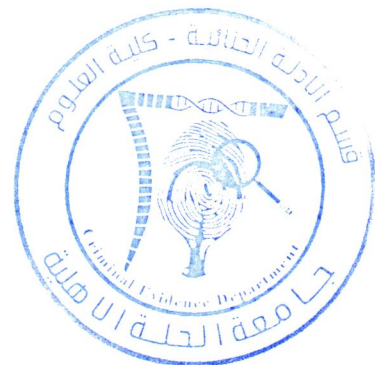
<b>Week 4</b>	Lab 4: Instruments and equipment in molecular lab
<b>Week 5</b>	Lab 5: Polymerase chain reaction
<b>Week 6</b>	Lab 6: Gel electrophoresis
<b>Week 7</b>	Lab 7: Exam
<b>Week 8</b>	Lab8:Chromosomal DNA extraction from bacteria
<b>Week 9</b>	Lab9:Chromosomal DNA extraction from plant
<b>Week 10</b>	Lab10:Plasmids isolation and extraction
<b>Week 11</b>	Lab11:Protein
<b>Week 12</b>	Lab12:Mutations
<b>Week 13</b>	Lab13:Real time PCR
<b>Week 14</b>	Lab14:Seminars
<b>Week15</b>	Review before final exam

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	Alberts B, et al. Essential Cell Biology, 5th Edition, Garland Science Pub., 2019 ISBN: 978-0393680393	Yes
<b>Recommended Texts</b>	Human Physiology: From Cells to Systems Lauralee Sherwood 7th ed. Brookes/Cole ISBN 9780495826293	No
<b>Websites</b>	<a href="https://www.modules.napier.ac.uk/Module.aspx?ID=BMS09112">https://www.modules.napier.ac.uk/Module.aspx?ID=BMS09112</a>	

<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.



# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Laboratory Instrument & Techniques		Module Delivery
Module Type			<input checked="" type="checkbox"/> Theory
Module Code	FOR24021		<input checked="" type="checkbox"/> Lecture
ECTS Credits	6		<input checked="" type="checkbox"/> Lab
SWL (hr/sem)	150		<input type="checkbox"/> Tutorial
			<input type="checkbox"/> Practical
			<input type="checkbox"/> Seminar
Module Level	2	Semester of Delivery	2
Administering Department	FOR	College	Science
Module Leader	M.Sc. Adel Sabah Abduljaleel	e-mail	Adel85hind89@gmail.com
Module Leader's Acad. Title	Assistant lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	M.Sc. Adel Sabah Abduljaleel	e-mail	Adel85hind89@gmail.com
Peer Reviewer Name	M.Sc. Adel Sabah Abduljaleel	e-mail	Adel85hind89@gmail.com
Scientific Committee Approval Date	12/12/2025	Version Number	1.0

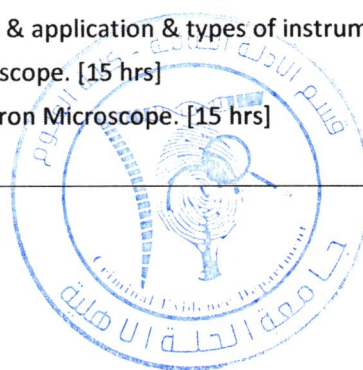
Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	



## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>This module aims to introduce students to Microscope and types , the spectroscopic and chromatographic techniques , Electrophoresis , Balance , Temperature control instrument , PCR &amp; RT-PCR and provide them with hands-on experience of laboratory instrumental analysis, further developing the practical skills gained in the Laboratory Chemical &amp; Biological module.</p> <p>This module also aims to provide training to the students on the research methodology and skills, <i>e.g.</i> literature survey, experimental design, data acquisition, result analysis and report writing-up, which will pave the way for their final year research project.</p>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<p>Knowledge and Understanding:</p> <ol style="list-style-type: none"><li>1 Formulate experimental methods for all instrument and design appropriate experimental set-ups.</li><li>2 Demonstrate the sample preparation and operational skills using the advanced all this instrument.</li><li>3 Acquire and critically assess experimental results with comparison to standards or databases.</li></ol> <p>Transferable/Key Skills and other attributes:</p> <ul style="list-style-type: none"><li>• Safe-working laboratory practices</li><li>• Observation, recording and presenting complex scientific data</li><li>• Numeracy, literacy, IT and Information management</li><li>• Time management</li><li>• Problem solving skills</li><li>• Literature search, data processing and academic writing skills</li><li>• Team working</li></ul>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Part A - primary information of laboratory instrument &amp; techniques</u></p> <p>On completion of this module, students are expected to be able to:</p> <ol style="list-style-type: none"><li>1 Demonstrate knowledge of introduction of instrument &amp; types</li><li>2 Demonstrate knowledge of the principle &amp; application &amp; types of instrument.</li><li>3 Demonstrate an understanding of Microscope. [15 hrs]</li><li>4 Demonstrate understanding of the Electron Microscope. [15 hrs]</li></ol>



	<p>Balance , Temperature control instrument ( Incubator , Water bath , Autoclave , Hot air oven , Hotplate Magenetic Stirrer ) and types. [16 h]</p> <p>PCR &amp; RT- PCR , Electrophoresis , chromatography , pHmeter ,Ultrasonic , Centrifuge . [15 hrs]</p> <p><u>Part B - essential and details</u></p> <p><b>Fundamentals</b></p> <p>To publicise the key learning resources that are important or essential for those studying the module or to demonstrate the academic foundation of the module. To provide a short list, indicating the type and level of information that students are expected to consult. Further, in depth, guidance and a comprehensive list of reading and resources should be made available . [15 hrs]</p> <p>Normally a short list of books or articles in reference format (author, date, title, and publisher). If a core text or textbook exists, this should be indicated. Lists should be indicative, rather than a full bibliography.. [7 hrs]</p> <p>To identify where the whole module may be taken by students at a distance, either by arrangement with the Programme Director or because it forms part of a programme that is wholly or partly delivered virtually. If distance learning is possible, a second module descriptor will need to be created, to identify learning, teaching, assessment and contact methods/support for students in the distance learning version of the module.. [15 hrs]</p>
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<b>Learning and Teaching Strategies</b> <b>استراتيجيات التعلم والتعليم</b>	
<b>Strategies</b>	<p>To describe the learning activities of the students and the teaching methods of the staff. Effective module design should result in a varied range of active learning experiences for students, including learning activities which are 'research-like'.</p> <p>Activities should, of course, motivate and encourage deep learning (reflection on wider meanings, rather than superficial memorisation of information). They should also be varied and flexible enough to accommodate different learning styles and orientations, and allow for inclusivity of students from different backgrounds and with different kinds of learning abilities.</p> <p>Learning activities therefore need to include reference to independent, interdependent (peer- supported) and online activities, as well as participation in different kinds of taught class.</p>



<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	86	<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	89	<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	175		

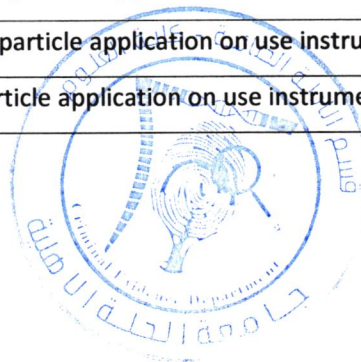
<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	<b>Assignments</b>	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	<b>Projects / Lab.</b>	1	10% (10)	Continuous	
	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

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	Introduction of instrument
<b>Week 2</b>	Microscope , light microscope and Electron Microscope
<b>Week 3</b>	Balance , Temperature control instrument ( Incubator , Water bath ) and types.
<b>Week 4</b>	Temperature control instrument ( Autoclave , Hot air oven , Hotplate Magenetic Stirrer ) and types.
<b>Week 5</b>	Polymerase chain reaction (PCR)
<b>Week 6</b>	Exam Mid-term Exam
<b>Week 7</b>	Real-Time polymerase chain reaction
<b>Week 8</b>	Electrophoresis



<b>Week 9</b>	Spectrophotometry
<b>Week 10</b>	Laboratory Centrifuge ( principle , types& Application).
<b>Week 11</b>	Chromatography (principle , types& Application).
<b>Week 12</b>	Ultrasonic (principle , types& Application).
<b>Week 13</b>	PHmeter (principle , types& Application).
<b>Week 14</b>	HPLC
<b>Week 15</b>	EXAM
<b>Week 16</b>	Preparatory week before the final Exam

<b>Delivery Plan (Weekly Lab. Syllabus)</b>	
المنهاج الاسبوعي للمختبر	
	<b>Material Covered</b>
<b>Week 1</b>	Lab 1 : Introduction of instrument
<b>Week 2</b>	Lab 2 : Microscope , light microscope and Electron Microscope (particle application on use instrument).
<b>Week 3</b>	Lab 3 : Balance , Temperature control instrument ( Incubator , Water bath ) and types. (particle application on use instrument).
<b>Week 4</b>	Lab 4: Temperature control instrument ( Autoclave , Hot air oven , Hotplate Magnetic Stirrer ) and types. (particle application on use instrument).
<b>Week 5</b>	Lab 5: Polymerase chain reaction (PCR) (particle application on use instrument).
<b>Week 6</b>	Exam Mid-term Exam (particle application on use instrument).
<b>Week 7</b>	Lab 6: Real-Time polymerase chain reaction(particle application on use instrument).
<b>Week 8</b>	Lab 7 : Electrophoresis(particle application on use instrument).
<b>Week 9</b>	Lab 8 : Spectrophotometry(particle application on use instrument).
<b>Week 10</b>	Lab 9 : Laboratory Centrifuge ( principle , types& Application). (particle application on use instrument).
<b>Week 11</b>	Lab 10 : Chromatography (principle , types& Application). (particle application on use instrument).
<b>Week 12</b>	Lab 11 : Ultrasonic (principle , types& Application). (particle application on use instrument).
<b>Week 13</b>	Lab 12 : PHmeter (principle , types& Application). (particle application on use instrument).
<b>Week 14</b>	Lab 113 : HPLC (principle , types& Application). (particle application on use instrument).



Week 15	Exam
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Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	FReece J, Urry L, Cain M, Wasserman S, Minorsky P, Jackson, R. (Eds) 9th Global Edition, 2011, Campbell Biology, Pearson Benjamin Cummings.	Yes
Recommended Texts	<p>Lobban C.S. (1992) <i>Successful Lab Reports: A Manual for Science Students</i>, Cambridge University Press.</p> <p>Higson, S.P.J. (2003) <i>Analytical Chemistry</i>, Oxford University Press.</p> <p>Skoog, D.A., Holler, F.J. and Nieman, T.A. (1998) <i>Principles of instrumental analysis</i>, Orlando: Harcourt Brace College Publishers.</p> <p>Mathew Folaranmi Olaniyan (2017) <b>LECTURE NOTES ON LABORATORY INSTRUMENTATION AND TECHNIQUES.</b> Edition: 1<sup>ST</sup> Editor: ACHIEVERS UNIVERSITY, OWO-NIGERIA/DR A.A. OLADELE(READER) ISBN: ACHIEVERS UNIVERSITY, OWO-NIGERIA</p>	No
Websites	Mathew OLANIYAN   Professor   PhD; Cert. in Immunology: PGDE; FMLSCN; FWAPCMLS in Immunology   Medical Laboratory Science/ School of Postgraduate Studies   Research profile ( <a href="http://researchgate.net">researchgate.net</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
	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.

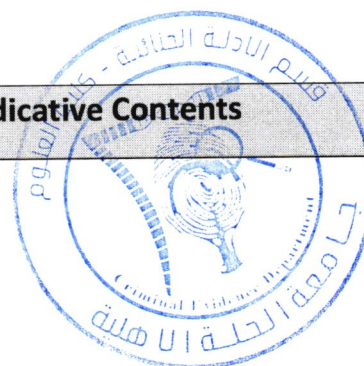


# MODULE DESCRIPTION FORM

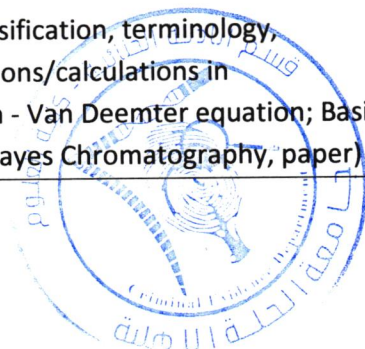
Module Information			
Module Title	Analytical Chemistry		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	FOR24120		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	2	Semester of Delivery	
Administering Department	FOR	College	Science
Module Leader	M.Sc. Mariam Hamid Abdulsattar	e-mail	Mariam.Hamid.Abdulsattar@uomus.edu.iq
Module Leader's Acad. Title	Assistant lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	M.Sc. Mariam Hamid Abdulsattar	e-mail	Mariam.Hamid.Abdulsattar@uomus.edu.iq
Peer Reviewer Name	M.Sc. Mariam Hamid Abdulsattar	e-mail	Mariam.Hamid.Abdulsattar@uomus.edu.iq
Scientific Committee Approval Date	10/12/2025	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	<p>The module provides an introductory overview of the:</p> <ol style="list-style-type: none"> <li>1- main techniques used in analytical chemistry.</li> <li>2- provides understanding of the fundamental principles of chemical analysis as well as the main aspects of their application.</li> <li>3- combination of lectures and practical sessions allows the students to get familiarised with the common practices in an analytical chemistry laboratory.</li> <li>4- Make able to calibration of instrumentation, validation, analysis of quality control samples, etc.)</li> <li>5- introduce them to health &amp; safety regulations and risk assessment.</li> </ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> <li>1. Understand and describe the fundamental principles and operation of analytical techniques, including spectroscopy, chromatography and electrochemistry.</li> <li>2. Undertake calculations associated to the calibration of instruments and analytical quantification, and evaluate experimental error.</li> <li>3. Operate basic analytical techniques, develop problem solving skills and be familiar with good laboratory practice.</li> <li>4. Appreciate the implications of the provisions for COSHH (Control of Substances Hazardous to Health) and Health and Safety regulations in the laboratory environment.</li> </ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>-Fundamentals of analytical chemistry– Good laboratory practice, health and safety, COSHH; Fundamentals of analytical measurement – accuracy, precision (repeatability and reproducibility), traceability, robustness, control charts.[15h]</p> <p>- Sample preparation – Sampling, decomposition &amp; dissolution.[10h]</p> <p>- Classical methods – Gravimetry &amp; titrimetry analysis[10h]</p> <p>- Spectroscopy – Fundamentals, Beer’s Law, instrumentation, and calculations; Atomic emission spectroscopy; Quantitative molecular spectroscopy – UV-vis absorption and fluorescence.[12h]</p> <p>- Introduction to separation science – Classification, terminology, fundamentals of solute interaction, equations/calculations in chromatography; Efficiency and resolution - Van Deemter equation; Basic chromatographic methods - planar (Thin Laves Chromatography, paper) and</p>



	<p>column chromatography.[15h]</p> <p>- Electrochemistry – Basic concepts, galvanic cells, standard potentials, Nernst equation, applications, problem solving, calculations and data presentation; Potentiometry - basic ion selective electrodes, pH electrode, applications. [14h]</p> <p>- Practical work on basic analytical techniques and laboratory good practice – Experiments on titration, electrochemistry, atomic emission spectroscopy and chromatography. [10h]</p>
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<b>Learning and Teaching Strategies</b> <b>استراتيجيات التعلم والتعليم</b>	
<b>Strategies</b>	<p>The assessment strategy is designed to provide students with the opportunity to demonstrate:</p> <ul style="list-style-type: none"> <li>- Understanding of fundamental principles of basic analytical techniques.</li> <li>- Know-how of the chemical analysis practice.</li> <li>- Competence to perform fundamental calculations.</li> <li>- Capacity for independent/critical thinking and problem-solving.</li> <li>- summative assessment for this module</li> </ul> <p>-Introduce the students to the fundamentals of the analytical techniques during the lectures. These would include the physical-chemical principles as well as design and operation of instrumental analytical techniques.</p> <ul style="list-style-type: none"> <li>- Provide hands-on experience in an analytical laboratory; including practice in sample preparation, operation and calibration of the instruments, validation, and analysis of unknown samples.</li> <li>- Encourage the development of their self-evaluation skills by describing the main sources of error during the practical experiments, nurturing problem-solving skills and critical thinking.</li> </ul>

<b>Student Workload (SWL)</b> <b>الحمل الدراسي للطالب</b>		
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	86	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً
		6.1



<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	89	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	6.2
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	175		

<b>Module Evaluation</b> 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)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	<b>Material Covered</b>
<b>Week 1</b>	Introduction to Analytical Chemistry
<b>Week 2</b>	Units, Concentration and Stoichiometry
<b>Week 3</b>	Concentration types
<b>Week 4</b>	Statistical treatment of analytical data
<b>Week 5</b>	standard solution 1
<b>Week 6</b>	standard solution 2
<b>Week 7</b>	Titration 1
<b>Week 8</b>	Titration 2
<b>Week 9</b>	Exam
<b>Week 10</b>	Acids and bases
<b>Week 11</b>	Spectrochemical analysis 1
<b>Week 12</b>	Spectrochemical analysis 2
<b>Week 13</b>	Separation methods 1

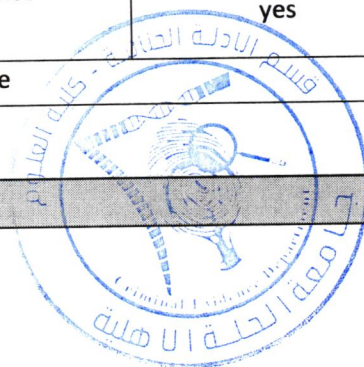


<b>Week 14</b>	Separation methods 2
<b>Week 15</b>	Exam
<b>Week 16</b>	Preparatory week before the final Exam

<b>Delivery Plan (Weekly Lab. Syllabus)</b> المنهاج الاسبوعي للمختبر	
	<b>Material Covered</b>
<b>Week 1</b>	Lab 1: General safety rules for laboratory
<b>Week 2</b>	Lab 2: General chemistry equipment
<b>Week 3</b>	Lab 3: Standard solution
<b>Week 4</b>	Lab 4: Preparation of standard solution from liquid solutions
<b>Week 5</b>	Lab 5: Buffer solution
<b>Week 6</b>	Lab 6: Titration strong acid with strong base
<b>Week 7</b>	Lab 7: Determination of acetic content in a vinegar sample
<b>Week 8</b>	Lab 8: Volumetric analysis (Mohr method)
<b>Week 9</b>	Lab 9 : pH-metric titration
<b>Week 10</b>	Conductmetric titration strong acid with strong base
<b>Week 11</b>	Separation of I group cations (Ag <sup>+</sup> , Pb <sup>2+</sup> , and Hg <sup>2+</sup> )
<b>Week 12</b>	Separation of II group cations
<b>Week 13</b>	Techniques of paper chromatography
<b>Week 14</b>	Exam

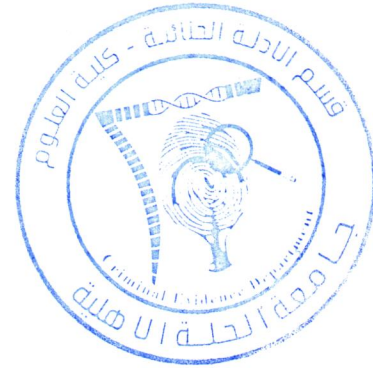
<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	<a href="https://guides.loc.gov/chemistry-resources/print-materials/analyticals">https://guides.loc.gov/chemistry-resources/print-materials/analyticals</a>	NO
<b>Recommended Texts</b>	<a href="https://guides.library.utoronto.ca/chm217/reference-resources">https://guides.library.utoronto.ca/chm217/reference-resources</a>	yes
<b>Websites</b>	<a href="https://www.coursera.inorg/browse/chem-science">https://www.coursera.inorg/browse/chem-science</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
	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.



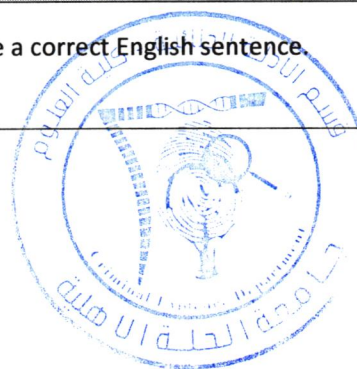
# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	English Language 2		Module Delivery
Module Type	Support		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	UNI 2-101		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	2	Semester of Delivery	
Administering Department	FOR	College	Science
Module Leader	Ammar Hassan Obayes	e-mail	ammam_hassan@hilla-unc.edu.iq
Module Leader's Acad. Title	Asst. Lecturer	Module Leader's Qualification	Master of Arts
Module Tutor	Ammar Hassan Obayes	e-mail	ammam_hassan@hilla-unc.edu.iq
Peer Reviewer Name	Non	e-mail	...
Scientific Committee Approval Date	21/09/2025	Version Number	V1

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	...
Co-requisites module	Non	Semester	...

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Providing students with the necessary rules to write a correct English sentence.

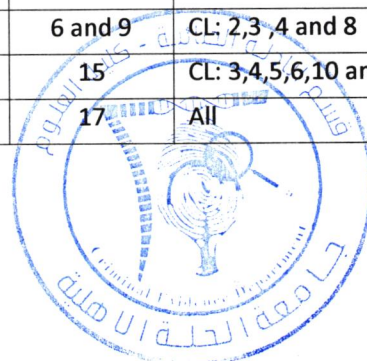


<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	Providing students with written expression skills so that they can write simple compositions while linking sentences correctly.
<b>Indicative Contents</b> المحتويات الإرشادية	Developing students' ability to understand what they read in English. present perfect form and use (10 hrs) The preposition (in, at, on) used in spatial expressions (30 hrs) universal pronouns (30 hrs)

<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	Giving live lectures, using the data show, and having students do the exercises.

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	30	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	40	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	70		

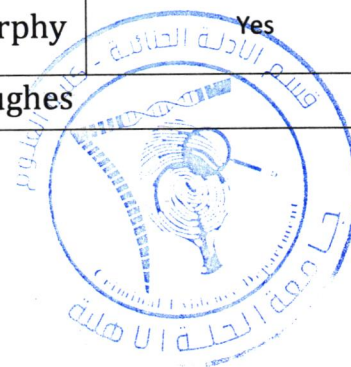
<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	15% (15)	5, 10, and 12	CL: 2,3 and 9,10 and 12
	<b>Assignments</b>	2	10% (10)	2 and 12	CL: 6 and 11
	<b>Seminar</b>	2	10% (10)	6 and 9	CL: 2,3 ,4 and 8
<b>Summative assessment</b>	<b>Midterm Exam</b>	2hr	10% (10)	15	CL: 3,4,5,6,10 and 14
	<b>Final Exam</b>	3hr	50% (50)	17	All



Total assessment	100% (100 Marks)		
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Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	present perfect form
Week 2	present perfect uses
Week 3	Adverbs of time used with the present perfect
Week 4	Comparison between the present perfect and past simple
Week 5	Doing the exercises on the present perfect and past simple
Week 6	Mid-term Exam
Week 7	The preposition <b>in</b> used in spatial expressions
Week 8	The preposition <b>at</b> used in spatial expressions
Week 9	The preposition <b>on</b> used in spatial expressions
Week 10	Doing the exercises on using <b>in, at, on</b> in spatial expressions
Week 11	universal pronouns
Week 12	Doing the exercises on universal pronouns
Week 13	will vs. going to
Week 14	Doing the exercises on will vs. going to
Week 15	Seminar Discussion
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	New Headway Plus: Preliminary	Yes
Recommended Texts	English Grammar in Use by Raymond Murphy	Yes
Websites	Online English Grammar by Anthony Hughes	



## Grading Scheme

### مخطط الدرجات

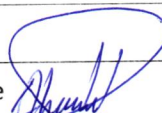
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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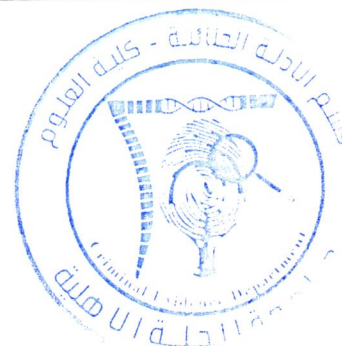


# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Investigation and criminal investigation		Module Delivery	
Module Type	Core		<input checked="" 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	FOR24023			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	2	Semester of Delivery		2
Administering Department	FORN	College	SC	
Module Leader	Ahmed.Hussein		e-mail	asdali123456ui@gmail.com
Module Leader's Acad. Title			Module Leader's Qualification	
Module Tutor	Name (if available)		e-mail	asdali123456ui@gmail.com
Peer Reviewer Name	Name		e-mail	asdali123456ui@gmail.com
Scientific Committee Approval Date	16/12/2025	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	2/1
Co-requisites module	None	Semester	



## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b></p> <p>أهداف المادة الدراسية</p>	<p>إذا كان الهدف الأسمى للتحقيق الجنائي هي البحث والتحري عن الحقيقة ، فإن المحقق وحده لا يمكنه القيام والغموض وعدم الإلمام بكل جوانبها بذلك بمفرده خصوصاً إذا كانت الجريمة المرتكبة يشوبها اللبس أو فني يصعب على المحقق فهمها وتحليلها ، ليس بسبب لاسيما إذا تعلق التحقيق بوقائع لها طابع علمي تكوين المحقق في حد ذاته وخبرته القانونية لا تتيجان له إدراك نقص الذكاء أو الخبرة أو الإدراك بل أن التقنيين والمتخصصين . أمور لها أهلها من</p> <p>لذا سوف نتناول في هذا المطلب التعريف بالخبرة ونبين أهميتها في الإثبات الجنائي.</p>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>تتميز مهمة الخبير بعدد من الخصائص وهي مهمة فنية ومحددة وذات طابع قضائي وإجراء اختياري للمحكمة ، وعلى هذا الأساس يجب على الخبير ان يمتلك المهارات الآتية:</p> <p>1- مهارة فنية</p> <p>أن أهم ما تتميز به الخبرة أنها ذات طابع فني ولجوء القاضي أو المحقق إلى الاستعانة بالخبير إنما تكون المسألة المطروحة في الدعوى الجزائية ذات طابع فني لا يستطيع كل منهما أن يقدرها حسب مؤهلاته وخبراته ، وعليه فإن مهمة الخبير تفترض استعانة الخبير بمعلوماته الفنية وتبعاً لذلك لا يعد خبيراً من يكلفه القاضي بمعاينة يعتمد فيها على حواسه فقط ، ولكن يعد خبيراً من كلفته المحكمة بأن يجري معاينة ويأتي بنتائج هذه الملاحظة إذا كانت تقتضي تطبيق أساليب علمية أو فنية.</p> <p>2- مهارة القدرة على تحديد حجم السلوك</p> <p>عند انتداب الخبير بتحديد المهمة التي يقوم بها والمسائل التي يلتزم بالإجابة أو الكشف أو التحليل عنها بما يتناسب واختصاصه الفني أو المهني، فالقاضي يعين للخبير في صورة واضحة ومحددة موضوع مهمته وفي بعض الحالات يضع له أسئلة معينة يتعين على الخبير أن يجيب عنها ، ولا يجوز أن تكون مهمة الخبير عامة تشمل إبداء رأي في الدعوى ، إذ يعد ذلك تخلياً من القاضي عن رسالته .</p> <p>3- مهارة قضائية</p> <p>المقصود بذلك أن مسألة اللجوء إلى الخبرة أمر تقررته المحكمة وحدها وهو أما بناء على طلب من الخصوم في الدعوى الجزائية أو استناداً إلى قرار تتخذه من تلقاء نفسها حسب تقديرها للمسألة المعروضة أمامها وحاجتها إلى رأي فني.</p> <p>وأن مسألة اختيار الخبير تعود إلى المحكمة والتي تعتد في ذلك بمعارفه الفنية، ولها أن تستشير الخصوم في هذا الشأن ولكنها غير ملزمة بطلبهم، فالخبير لا يمارس مهمته إلا بانتداب قضائي، إلا بانتداب قضائي، ويؤدي مهمته تحت إشراف القاضي، وخالصة عمل الخبير التي يتضمنها تقريره تخضع في النهاية لتقدير القاضي .</p> <p>4- مهارة إختيارية</p> <p>الأصل في الخبرة أنها إجراء اختياري للمحكمة وهذا يعني أن المحكمة غير ملزمة بإجابة طلبات الخصوم بطلب خبير في الدعوى ما دامت ترى في أدلة الدعوى المطروحة أمامها ما يمكنها من حسم الدعوى دون الاستعانة برأي الخبير .</p> <p>وتطبيقاً لذلك قضت محكمة النقض المصرية بأنه " لا إخلال بحق الدفاع إذا لم تجب المحكمة طلب تعيين خبير لفحص العقد العقول بتزويره متى كان فيما ذكره حكمها عن طريق التزوير وثبوته على المتهم ما يفيد أن المحكمة اقتنعت بما شاهدته وما تبينته من وقائع الدعوى وأقوال الشهود بحصول التزوير وبأنها لم تكن في حاجة إلى الاستعانة برأي فني في ذلك " ، وقضت محكمة تمييز العراق بأن " المحكمة غير ملزمة باستدعاء خبير آخر إذا كانت الواقعة المبحوث عنها واضحة وضوحاً كافياً ، وفي هذه الحالة يتعين على المحكمة تسيب رفضها " .</p>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p>إذا كان على المحقق أن يتفرغ لأعمال البحث والتحقيق كالاستجواب ومناقشة الشهود والكشف والتفتيش وجمع المعلومات الأخرى فإن العناية بالأثار وفحصها ينبغي أن تترك للخبير متخصص في هذا النوع من العمل ، ومن ثم فإن الخبير هو ذلك الشخص الذي اكتسب خبرة عملية وفنية نتيجة لدراسات علمية كالطب العدلي أو المحلل الكيميائي أو نتيجة لممارسة مهنة معينة فترة من الزمن كإرباب الحرف والصناعات كالتجارين والحدادين وغيرهم .</p> <p>ومن الجائز أن يبلي الخبير برأيه شفوياً أمام المحقق الذي ينبغي عليه أن يدونه في محضر التحقيق ثم يوقع عليه كليهما ، عليه فإن عمل الطبيب العدلي أو خبير المختبر الجنائي مع المحقق أمر لا بد منه لإزاحة الستار عما يكتنف الجريمة من غموض وملابسات وكلما زاد هذا التعاون بين الاثنين كلما سهل اكتشاف الجريمة ومعرفة مرتكبها ، علماً أن المحقق أو القاضي غير ملزم بالأخذ برأي الخبير طبقاً لمبدأ الاقتناع الذاتي للقاضي وتكوين رايه واعتقاده بالإدانة أو البراءة في الأمور الجنائية حسب اعتقاده فهو خبير الخبراء وله كلمة الفصل في الأمور الجنائية.</p> <p>أن تخويل القاضي للخبير في إبداء مشورته بخصوص الواقعة أو بشأن مسؤولية المتهم هو نوع من التوكيل ، وقد تعرض هذا الرأي إلى انتقادات عديدة من بينها أن رأي الخبير لا يلزم أحداً ، كما أن الخبير لا يعد مسؤولاً عن أخطائه غير الجسيمة بخلاف العلاقة التي تربط الوكيل بالموكل ، حيث أن الأول يمثل الثاني بكيفية تلمه تجاه الغير ويكون هذا ملزماً به وفقاً لعقد التوكيل ذلك لأن الغرض من الوكالة هو القيام بأعمال قانونية لحساب الموكل كذلك ليس للوكيل أن يتمتع بسلطات أكثر من موكله ، بينما الخبرة تختلف تماماً عن هذا الأمر فهي لا تلزم القاضي في الأخذ بها من جهة وليس باستطاعة القاضي القيام بعمل الخبير وليس لها أن يتمتع بسلطات القاضي .</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<p><b>Strategies</b></p>	<p>الخبرة تمثل معلومات فنية يحصل عليها القائم بالتحقيق من إرباب الفن والحرف والمعرفة وهذه معلومات تساعده في حل ما يشكل عليه من الأمور التي لا يمكن حلها بمعلوماته الخاصة والوصول إلى نتائج جسيمة بشأنها عدم الإلمام بالأمور والمسائل التي ربما يتوقف الوصول للدليل عليها والذي يكون هو دليل إثبات في ارتكاب الجريمة ونسبها لفاعلها الأعلى سبيل المثال لا يمكن للباحث الجنائي أو القاضي التوصل إلى كفاية المادة السامة التي يستعملها الجاني في أحداث الوفاة ما لم يستعين بأحد اصحاب الاختصاص من الكيميائيين لمعرفة ذلك. سيما أن هناك العديد من القضايا التي تلعب فيها الخبرة للبور الفاعل والرئيس في الفصل في غموضها وكشف ملابسات الجريمة. وأحياناً تكون الخبرة هي البينة الوحيدة التي يمكن بواسطتها التوصل إلى البراد الثابت، وذلك فإن الخبرة طريقة من طرق التحقيق، ومن مفارقات الحال انه قد تكون الخبرة على نقض</p>
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	<p>ادلة عديدة, وبالرغم من ذلك يعتمد الباحث لأنها تبنى على اليقين من ذوي الاختصاص ومن النادر يتسرب إليها الشك والاحتمال.</p> <p>ويحصل الخبير على خبرته من خلال ممارسة مهنة معينة أو عمل أو اختصاص علمي, ولكن لا نسلم الى القول بان يُعد خبيراً كل من يسند اليه المحقق أو القاضي مهمة ذات طبيعة خاصة مالم تتوافر فيه صفة الإدراك والاستنتاج فضلاً عن الأمانة والإخلاص.</p>
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<b>Student Workload (SWL)</b>			
الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	72	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	5.1
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	28	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	2
<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	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)		

<b>Delivery Plan (Weekly Syllabus)</b>	
المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	1-مفهوم الخبير الجنائي
<b>Week 2</b>	2-علاقه الخبير الجنائي بالخبير المدني



Week 3	3-التنظيم القانوني للخبير الجنائي
Week 4	4-المسؤولية القانونية للخبير الجنائي
Week 5	5-اليات عمل الخبير الجنائي
Week 6	6-الحمايه القانونيه للخبير الجنائي
Week 7	7-العلاقه بين المحقق والخبير
Week 8	8-خصائص الخبير الجنائي
Week 9	9-امتحان
Week 10	10-المسوليه المدنيه للخبير
Week 11	11-المسوليه الجنائيه للخبير
Week 12	12-اجاءات انتداب الخبير الجنائي
Week 13	13-رسوم الخيره الجنائيه
Week 14	14-القيمه القانونيه للخبره الجنائيه
Week 15	Exam
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly tot. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	2-علاقه الخبير الجنائي بالخبير المدني
Week 2	4-المسوليه القانونيه للخبير الجنائي
Week 3	5-اليات عمل الخبير الجنائي
Week 4	7-العلاقه بين المحقق والخبير
Week 5	11-المسوليه الجنائيه للخبير
Week 6	14-القيمه القانونيه للخبره الجنائيه
Week 7	14-القيمه القانونيه للخبره الجنائيه

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts		Yes
Recommended Texts		No



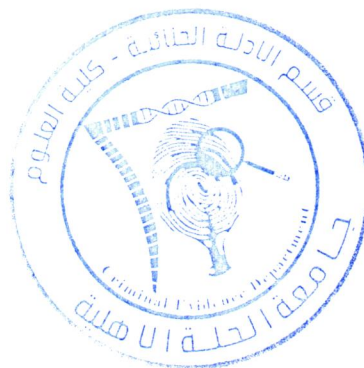
Websites

### Grading Scheme

مخطط الدرجات

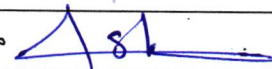
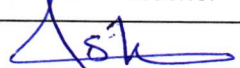
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	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.

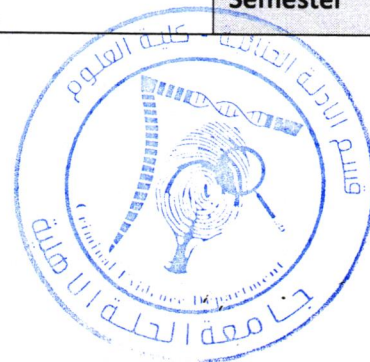


# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Forensic Computer Applications		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input checked="" type="checkbox"/> Seminar
Module Code	UNI 2-103		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	2 <sup>nd</sup>	Semester of Delivery	
Administering Department	FOR	College	Science
Module Leader	م.م شهد رائد هادي 	e-mail	shahed.raed@hilla-unc.edu.iq
Module Leader's Acad. Title	Assistant Teacher	Module Leader's Qualification	MSc.
Module Tutor	م.م شهد رائد هادي 	e-mail	shahed.raed@hilla-unc.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	17/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Basic Computer Science	Semester	1
Co-requisites module	None	Semester	



## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b></p> <p>أهداف المادة الدراسية</p>	<p>This course forensic computer application includes interactive lectures and practical applications to teach students the remaining MATLAB functions for the purpose of enhancing and analyzing criminal images. These functions include techniques for clarifying and removing fog and noise, which help forensic experts in identifying and distinguishing the offender.</p> <p>The course comprises interactive lectures and hands-on exercises that enable students to apply image processing algorithms and enhancement methods. Additionally, it equips students with the skills to analyze forensic images through various examples.</p>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>Studying the course on forensic computer applications can lead to several learning outcomes, including:</p> <ol style="list-style-type: none"><li>1. Providing students with skills in utilizing ready-made functions in MATLAB.</li><li>2. Learning about algorithms and their application in problem-solving.</li><li>3. Understanding the different types of images and their significance in processing. Students will acquire digital image processing skills using the MATLAB language.</li><li>4. Proficiency in Image Enhancement and Restoration: Students will gain expertise in applying image enhancement techniques to improve the visual quality of forensic images. They will learn methods to reduce noise, enhance contrast, and sharpen edges while preserving important anatomical details.</li><li>5. Image Segmentation and Region of Interest Extraction: Developing skills in segmenting forensic images to identify and extract specific regions of interest (ROIs) or anatomical structures. Students will learn about segmentation algorithms such as thresholding, region growing, active contour models, and clustering methods.</li><li>6. Feature Extraction and Analysis: Learning how to extract meaningful features from forensic images that can be used for further analysis and characterization. Students will understand feature extraction techniques such as texture analysis, shape analysis, intensity-based features, and statistical features.</li><li>7. Pattern Recognition and Classification: Acquiring knowledge in developing machine learning and pattern recognition algorithms for automatic detection, classification, and recognition of structures or abnormalities in forensic images. Students will comprehend concepts such as feature selection, classifier design, and performance evaluation.</li></ol>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Part A</u></p> <p>Functions &amp; Files, Elementary Mathematical Functions, User Defined, Functions</p>

Advanced Function Programming , Working with Data Files (read and write data file), Programming Techniques: Image Types , •Indexed images, •Intensity (or grayscale) images, •RGB images, Convert signals from an image sensor into digital images, Convert Between Image Types, Convert Between Data Types. [6 hrs]

#### Part B

Introduction in forensic image processing, Image processing in MATLAB, Read Image, Show Image, Displaying Images ,Writing Images, Image Rotation and Scale, Digital Image, Basic relationship between image pixels, Image Enhancement, Contrast Manipulation. [6 hrs]

#### Part C

Noise Removal, Linear Filtering, Nonlinear Filter, Filters for noise removal, 1. Mean Filtering, 2. Median Filtering, 4. Rank filtering, Modeling the Degradation Function, Use function deconvreg to restore a blurred, noisy image, Gaussian Blur Filter, Histogram Equalization, Adjust Intensity Values Using Histogram Equalization. [10 hrs]

#### Part D

Edge Detection, Canny Edge Detector, Sobel Edge Detection, Deblurring Images Using the Lucy-Richardson Algorithm, Definition the Analysis of forensic Images, Definition features detection, Perform Thresholding and Morphological Operations on Image, Morphological Dilation and Erosion, Corners, Template Matching. [10 hrs]

#### Part E

Definition the texture, Properties of textures, Create Gray-Level Co-occurrence (GLCM) Matrix from image, Image Segmentation, Point, Line, and Edge Detection, Use Intensity Thresholding to segment the object from the background of the image. [8 hrs]

#### Part F

Classification and Clustering, Definition the classification, Classification Based on Distance to Training Samples, Minimum distance classification, K nearest neighbor classifier, Examples using MATLAB, Decision Boundaries, Adaptive Decision Boundaries. [8 hrs]

#### Part G

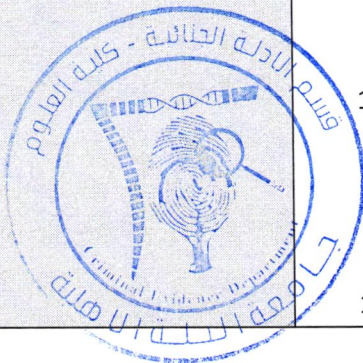
Biological Neural System, The Multilayer Perceptron, Structure of the Multilayer Perceptrons, Create a Perceptron Network (nntool) ,Create Network ,Train the Perceptron, Export Perceptron, Results to Workspace, Clear Network/Data Window, Importing from the Command Line, Save a Variable to a File and Load It Later, Applications in forensic Image Analysis, Classification by Association, Multiple Instance Learning, Bag of Visual Words, Dealing with Imbalanced Data. [12 hrs]

### **Learning and Teaching Strategies**

When it comes to forensic image processing and analysis using MATLAB, here are some strategies to consider:

1. Introduce the concepts of forensic image analysis: we start by providing an overview of forensic image analysis and its applications, such as image enhancement, restoration, forgery detection, and facial recognition.
2. Familiarize students with MATLAB's image processing toolbox: Teach students how to use MATLAB's image processing toolbox, which offers a wide range of functions and algorithms for forensic image analysis. Cover topics such as image filtering, histogram equalization, noise removal, and edge detection.
3. Hands-on exercises and projects: Provide students with hands-on exercises and projects that involve applying forensic image processing techniques using MATLAB. Assign tasks such as enhancing low-light images, removing noise from images, detecting image forgeries, or performing facial recognition.
4. Image visualization and analysis: Demonstrate how to visualize and analyze images using MATLAB. Show students how to display, manipulate, and explore forensic images using functions like imshow, imtool, or montage. Teach them techniques for extracting features, measuring image properties, and performing quantitative analysis.
5. Image enhancement and restoration: Teach students various image enhancement and restoration techniques using MATLAB. Cover topics such as contrast adjustment, noise reduction, image sharpening, and image inpainting.
6. Forgery detection and authentication: Explore techniques for detecting image forgeries, such as copy-move forgery detection, splicing detection, and image tampering analysis.
7. Facial recognition: Introduce facial recognition techniques and algorithms using MATLAB. Explain the concepts of feature extraction, face detection, and face matching. Demonstrate how to build a basic facial recognition system using MATLAB's facial recognition toolbox or relevant libraries.
8. Error handling and robustness: Emphasize the importance of error handling and robustness in forensic image processing. Teach students how to handle common challenges and issues in image analysis, such as variations in lighting, noise, or image distortions.
9. Validation and verification: Discuss the importance of validation and verification in forensic image analysis. Teach students how to validate their results, evaluate the performance of their algorithms, and compare different approaches.
10. Collaboration and interdisciplinary learning: Foster collaboration among students from different disciplines, such as computer science, forensic science, and law enforcement. Encourage interdisciplinary discussions and projects that combine image processing techniques with forensic science knowledge.
11. Stay updated with advancements in forensic image processing: Stay informed

Strategies



about the latest research and advancements in the field of forensic image processing. Incorporate recent techniques and algorithms into your teaching to expose students to current trends and emerging technologies.

12. Ethical considerations: Discuss ethical considerations and legal implications related to forensic image processing. Teach students about privacy concerns, data integrity, and the ethical use of image analysis techniques in forensic investigations.

By implementing these strategies, you can provide students with a solid foundation in forensic image processing and analysis using MATLAB, preparing them for careers in forensic science, law enforcement, or image analysis research.

### 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	40	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	2.7
<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
Formative assessment	Quizzes	2	5% (5)	5, 15	LO # 1,2,3,4,9 and 10
	Assignments	2	10% (10)	6, 14	LO # 5, 6,7,8, 11 and 12
	Projects / Lab.	1	20% (20)	Continuous	
	Report	1	5% (5)	16	LO # 13, 15
Summative assessment	Midterm Exam	2hr	10% (10)	9	LO # 1-8
	Final Exam	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>	Functions & Files, Elementary Mathematical Functions, User Defined Functions Advanced Function Programming , Working with Data Files (read and write data file).
<b>Week 2</b>	Programming Techniques: Image Types , •Indexed images, •Intensity (or grayscale) images, •RGB images, Convert signals from an image sensor into digital images, Convert Between Image Types, Convert Between Data Types, Examples.
<b>Week 3</b>	Introduction in forensic image processing, Image processing in MATLAB, Read Image, Show Image, Displaying Images ,Writing Images, Image Rotation and Scale, Examples.
<b>Week 4</b>	Digital Image, Basic relationship between image pixels, Image Enhancement, Contrast Manipulation
<b>Week 5</b>	Noise Removal, Linear Filtering, Nonlinear Filter, Filters for noise removal, 1. Mean Filtering, 2. Median Filtering, 4. Rank filtering.
<b>Week 6</b>	Modeling the Degradation Function, Use function deconvreg to restore a blurred, noisy image, Gaussian Blur Filter, Histogram Equalization, Adjust Intensity Values Using Histogram Equalization.
<b>Week 7</b>	Edge Detection, Canny Edge Detector, Sobel Edge Detection, Deblurring Images Using the Lucy-Richardson Algorithm.
<b>Week 8</b>	Definition the Analysis of forensic Images, Definition features detection, Perform Thresholding and Morphological Operations on Image, Morphological Dilation and Erosion, Corners, Template Matching.
<b>Week 9</b>	Definition the texture, Properties of textures, Create Gray-Level Co-occurrence (GLCM) Matrix from image.
<b>Week 10</b>	Image Segmentation, Point, Line, and Edge Detection, Use Intensity Thresholding to segment the object from the background of the image.
<b>Week 11</b>	Classification and Clustering, Definition the classification, Classification Based on Distance to Training Samples, Minimum distance classification.
<b>Week 12</b>	K nearest neighbor classifier, Examples using MATLAB, Decision Boundaries, Adaptive Decision Boundaries.
<b>Week 13</b>	Biological Neural System, The Multilayer Perceptron, Structure of the Multilayer Perceptrons.
<b>Week 14</b>	Create a Perceptron Network (nntool) ,Create Network ,Train the Perceptron, Export Perceptron, Results to Workspace, Clear Network/Data Window, Importing from the Command Line, Save a Variable to a File and Load It Later, Applications in forensic Image Analysis.
<b>Week 15</b>	Classification by Association, Multiple Instance Learning, Bag of Visual Words, Dealing with Imbalanced Data, Exercises.
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

#### Material Covered

<b>Week 1</b>	Lab 1: Functions & Files, Working with Data Files (read and write data file).
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<b>Week 2</b>	Lab 2: Programming Techniques: Image Types , •Indexed images, •Intensity (or grayscale) images, •RGB images, Convert signals from an image sensor into digital images, Examples of convert between Image Types, Convert Between Data Types, Examples of Image Rotation and Scale, Read Image, Show Image.
<b>Week 3</b>	Lab 3: Read, write, display images, Image Rotation and Scale, Contrast Adjustment, Histogram Equalization
<b>Week 4</b>	Lab 4: Rank and Max-Min Filters
<b>Week 5</b>	Lab 5: Edge Detection, Thresholding, Morphological (Dilation and Erosion) Operations and Corners on Image, Template Matching and Texture.
<b>Week 6</b>	Lab 6: Create Gray-Level Co-occurrence (GLCM) Matrix from image, Image Segmentation Polynomial and Global thresholds
<b>Week 7</b>	Lab 7: Classification and Clustering , Perceptron Network

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	1- Matlab: Numerical Computing, Tutorial point, 2014. 2- Alasdair McAndrew, An Introduction to Digital Image Processing with Matlab, Notes for SCM2511 Image, Processing 1, Semester 1, 2004, School of Computer Science and Mathematics, Victoria University of Technology. 3- Gonzalez R. C." Digital Image Processing", Woods R. E. ,2008 Image Processing for Computer Graphics and Vision, by Luiz Velho • Alejandro C. Frery •Jonas Gomes 2009 4- Sammes, A., & Jenkinson, G. (Eds.). (2016). Forensic Computing: A Practitioner's Guide. Springer.	Yes
<b>Recommended Texts</b>	1- Sutherland, I. E. (Ed.). (2021). Handbook of digital image processing: with examples in MATLAB. Springer. 2- Kouzmanoff, S., & Khan, H. (2019). Handbook of Digital Forensics and Investigation. Academic Press.	No
<b>Websites</b>		

### Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<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

	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.

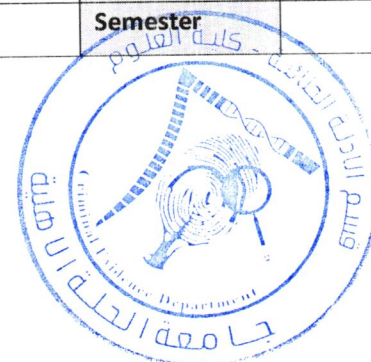


# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Biochemistry		Module Delivery	
Module Type	Core		<input checked="" 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	FOR23013			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	2	Semester of Delivery		1
Administering Department	FOR	College	Science	
Module Leader	Mariam Hamid Abdulsattar		e-mail	Mariam.Hamid.Abdulsattar@uomus.edu.iq
Module Leader's Acad. Title	Assistant lecturer	Module Leader's Qualification	M.Sc.	
Module Tutor	Mariam Hamid Abdulsattar		e-mail	Mariam.Hamid.Abdulsattar@uomus.edu.iq
Peer Reviewer Name	Mariam Hamid Abdulsattar		e-mail	Mariam.Hamid.Abdulsattar@uomus.edu.iq
Scientific Committee Approval Date	13/12/2025	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

<p><b>Module Aims</b></p> <p>أهداف المادة الدراسية</p>	<p>1-This module aims to teach you core concepts in biochemistry including topics on structure of proteins, enzyme kinetics and metabolic pathways.</p> <p>2-The module will also provide a background to fundamental aspects of chemistry.</p> <p>3-This module provides you with the core knowledge and skills to enhance performance in the area of biological chemistry towards best benefit for forensic science in:</p> <ul style="list-style-type: none"><li>❖ Metabolism, Analytical Techniques in Biochemistry,</li><li>❖ Bioinorganic Chemistry</li><li>❖ Energy Metabolism</li></ul>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>Module-specific skills</p> <ol style="list-style-type: none"><li>1. Understand the biological, chemical and physical principles associated with forensic investigation.</li><li>2. Discuss the analytical techniques used in forensic science and their correct choice.</li><li>3. Demonstrate knowledge of the principal scientific techniques and skills required for the recognition, processing, recording, preservation, recovery, analysis and interpretation of evidence at and from a range of crime scenes.</li><li>4. Evaluate the limitations and principles of uncertainty in analysis and interpretation of forensic evidence.</li><li>5. Construct logical arguments and effectively communicate theories in different formats, including crime scene maps and a sequence of events.</li><li>6. Interpret written instruction to create time and spatial reconstructions of complex events with attention to detail.</li></ol>



	<p>Personal and key skills</p> <p>7. Apply scientific principles to real life situations</p> <p>8. Analyse and evaluate independently a range of research-informed literature and synthesise research-informed examples from the literature into written work</p> <p>9. Illustrate and discuss the contested and provisional nature of knowledge and understanding</p> <p>10. Analyse in detail essential facts and theory in a sub-discipline of the biosciences</p> <p>11. Apply factual information to develop, with some guidance, a logical and reasoned argument with valid conclusions.</p> <p>12. Effectively communicate justifications, evidence and conclusions using both graphical and written means in a manner appropriate to the intended audience.</p> <p>13. Work in a small team and deal proficiently with the issues that teamwork requires (i.e. communication, motivation, decision-making, awareness, responsibility, and management skills, including setting and working to deadlines)</p>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<ul style="list-style-type: none"> <li>• <b>Examination [10h]</b> Written assessment typically includes exams and multiple choice tests.</li> <li>• <b>Practical[10h]</b> Practical is an assessment of your skills and competencies. This could include presentations, school experience, work experience or laboratory work. [10h]</li> <li>• <b>Coursework [12h]</b> Coursework typically includes essays, written assignments, dissertations, research projects or producing a portfolio of your work.[10h] <ul style="list-style-type: none"> <li>• Final year research projects allow students to gain considerable research experience in one of the research laboratories. Working alongside world-leading researchers enriches the students experience and assists them in pursuing a career in biochemical research.[12h]</li> </ul> </li> </ul>

**Learning and Teaching Strategies**



## استراتيجيات التعلم والتعليم

<b>Strategies</b>	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in discussion , for verities of information which could be applied to make real and ideal behaviour with forensic as science and as skills should be developed.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)

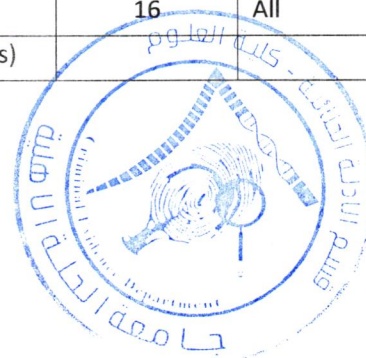
### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	86	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	6.1
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	64	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

## 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 Syllabus)

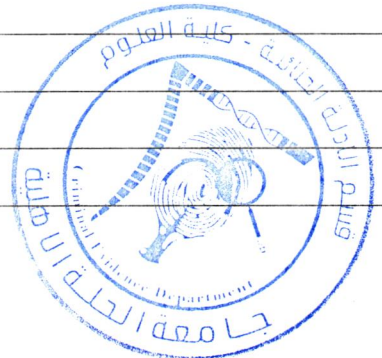
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Biochemistry
Week 2	Enzymes 1
Week 3	Enzymes 2
Week 4	Carbohydrates 1
Week 5	Carbohydrates 2
Week 6	Carbohydrates 3
Week 7	Carbohydrates Metabolism
Week 8	Exam
Week 9	Lipids
Week 10	Lipids Metabolism
Week 11	Cholesterol
Week 12	Amino Acids
Week 13	Proteins 1
Week 14	Proteins 2
Week 15	Exam
Week 16	Preparatory week before the final Exam

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Chemistry Laboratory Safety Rules
Week 2	Lab 2: Spectrophotometry
Week 3	Lab 3: Determination of Ca Concentration in Serum
Week 4	Lab 4: Determination of P Concentration in Serum
Week 5	Lab 5: Determination of Total Iron Concentration in Serum
Week 6	Lab 6: Determination of Mg Concentration in Serum
Week 7	Lab 7: Exam
Week 8	Lab 8: Determination of Glucose Concentration in Serum



<b>Week 9</b>	Lab 9:Determination of Urea Concentration in Serum
<b>Week 10</b>	Lab 10:Determination of Creatinine Concentration in Serum
<b>Week 11</b>	Lab11:Determination of Uric Acid Concentration in Serum
<b>Week 12</b>	Lab 12:SGOT and SGPT
<b>Week 13</b>	Lab 13:Glucose Tolerance Test
<b>Week 14</b>	Exam
<b>Week 15</b>	Review All Previous Experiences

### Learning and Teaching Resources

مصادر التعلم والتدريس

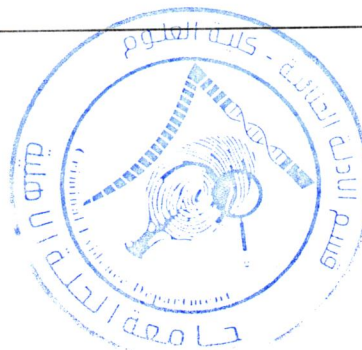
	Text	Available in the Library?
<b>Required Texts</b>	R. H. Garrett, C. M. Grisham, Biochemistry, Brooks / Cole Cengage Learning, 2011	Yes
<b>Recommended Texts</b>	R. Brückner, Reaktionsmechanismen, Spektrum Verlag, 3rd Edition, 2004	No
<b>Websites</b>	<a href="https://biosciences.exeter.ac.uk/staff/module/?mod_code=BIO2068">https://biosciences.exeter.ac.uk/staff/module/?mod_code=BIO2068</a>	

### Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<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.



# MODULE DESCRIPTION FORM

Module Information			
Module Title	Anatome and Physiology		Module Delivery
Module Type	Core		<input checked="" 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	FOR23015		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	
Administering Department	Forensic \FOR	College	science
Module Leader	Abeer Imad alnfie	e-mail	abeer.emad@hilla-unc.edu.iq
Module Leader's Acad. Title		Module Leader's Qualification	M.s.c
Module Tutor	Abeer Imad alnfie	e-mail	abeer.emad@hilla-unc.edu.iq
Peer Reviewer Name		e-mail	abeer.emad@hilla-unc.edu.iq
Scientific Committee Approval Date	15/12/2025	Version Number	1.0

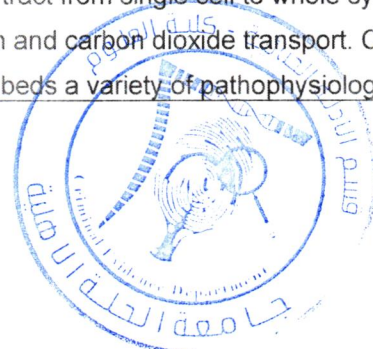
Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	



## Module Aims, Learning Outcomes and Indicative Contents

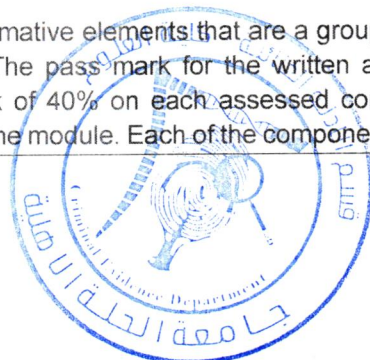
### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b></p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"><li>1. The aim of the module is to introduce and explore the fundamental concepts of human physiology and anatomy from cellular functions through to systems that are responsible for homeostasis.</li><li>2. The module aims to begin with the broader principles of how cells communicate and how cells function.</li><li>3. To explore key anatomy with physiological systems:<ul style="list-style-type: none"><li>➤ investigating the central and peripheral nervous systems,</li><li>➤ how differing muscles are stimulated to contract,</li><li>➤ the digestive system and key associated nutritional principles, the cardiorespiratory system,</li><li>➤ the renal system and its regulatory role and the immune system and how it aims to protect the body against infection and disease.</li></ul></li><li>4. This module also aims to introduce the principles of group learning, critical thinking, problem solving and communication of scientific information.</li></ol>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>On successfully completing the module you will be able to...</p> <ul style="list-style-type: none"><li>• 1. Demonstrate an integrated basic knowledge of the biomedical principles underpinning human health with forensic science .</li><li>• 2. Demonstrate a basic awareness of the scientific principles underpinning the prevention, diagnosis and management of some important diseases</li><li>• 3. With guidance, apply skills of critical thinking, problem-formulation and problem-solving.</li></ul>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p>1-Cardiovascular physiology [10h]</p> <p>Structure and function of the heart and blood vessels from single cell to whole system. Cardiac electrical activity and its measurement. Perfusion and its control. Blood pressure regulation. Embeds a variety of anatomical and pathophysiological examples with reference to both biomedical and forensic applications throughout e.g. coronary heart disease.</p> <p>2-Respiratory anatomy and physiology [10h]</p> <p>Structure and function of the respiratory tract from single cell to whole system. Lung mechanics and ventilation. Oxygen and carbon dioxide transport. Central and peripheral control of respiration. Embeds a variety of pathophysiological</p>



	<p>examples with reference to both biomedical and forensic applications throughout e.g, asthma</p> <p>3 -Reproductive anatome and physiology[15h]</p> <p>Structure and functions of the reproductive systems from single cell to whole system. Normal body control of the female reproductive system and hormonal cycles. Embeds a variety of anatomical and psychophysiology examples with reference to both biomedical and forensic applications throughout e.g. infertility.</p> <p>4- Neuro and sensory anatomical and physiology [15h]</p> <p>Basic structures and divisions of the peripheral and central nervous system from single cell to whole system. Structure and function of nerves and the cells in the nervous system. How nerves communicate. Higher CNS functions and the ANS. Structure and function of key sensory organs. Embeds a variety of anatomical and pathophysiological examples with reference to both biomedical and forensic applications throughout e.g. dementia</p> <p>5 -Skeletomuscular system [14]</p> <p>Skeletal muscle structure and ultrastructure. Muscle and fibre types. Functions of tendons, joints, bones, muscle ligaments and fascia. The neuromuscular junction. Excitation - contraction coupling. The sliding filament theory. Muscle spindles. Golgi tendon organs. Reflex arcs. Embeds a variety of anatomical and pathophysiological examples with reference to both biomedical and forensic applications throughout e.g. muscular dystrophy.</p>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<p>The module will consist of lectures with theoretical analysis and real-world examples and applications to improve students' learning and analytical skills. In-class group discussions of research papers will facilitate deeper understanding and encourage critical thinking.</p> <p>The assessment includes two summative elements that are a group recorded quiz and an individual written essay. The pass mark for the written assignment and module is 50%. A qualifying mark of 40% on each assessed component of the module must be achieved to pass the module. Each of the component marks is then</p>



combined, using the appropriate weighting, to give an overall mark for the module. If the overall mark is less than 50% when the weighting has been applied to the components, this constitutes a failure of the module.

### Student Workload (SWL)

الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	86	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	6.1
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	64	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

### Module Evaluation

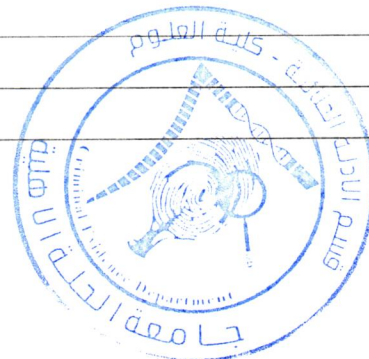
تقييم المادة الدراسية

		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 Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
<b>Week 1</b>	Intruduction for <u>Anatomy</u> and <u>Physiology</u> Organizing Principles such as Homeostasis & Feedback Loops
<b>Week 2</b>	Cell, tissue , and Membrane
<b>Week 3</b>	Skelton, and muscular
<b>Week 4</b>	Nervous and endocrine system



<b>Week 5</b>	Cell Physiology & Membrane Transport
<b>Week 6</b>	Tissue Physiology, Neurophysiology and Sensory Physiology
<b>Week 7</b>	Endocrinology, Muscle Physiology
<b>Week 8</b>	Cardiovascular and Respiratory Physiology
<b>Week 9</b>	Immunology
<b>Week 10</b>	Lymphatic and Respiratory System
<b>Week 11</b>	Osmoregulatory Physiology
<b>Week 12</b>	Gastrointestinal Physiology
<b>Week 13</b>	Reproductive Physiology
<b>Week 14</b>	Digestive and Urinary System
<b>Week 15</b>	exam
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

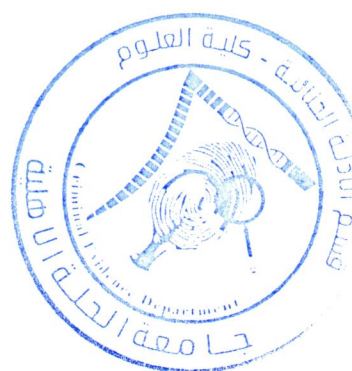
المنهاج الاسبوعي للمختبر

	<b>Material Covered</b>
<b>Week 1</b>	Lab 1: Erythrocyte Physiology
<b>Week 2</b>	Lab 2: Pulse and Pressure
<b>Week 3</b>	Lab 3: EEG and States of Consciousness
<b>Week 4</b>	Lab 4: Brain Imaging
<b>Week 5</b>	Lab 5: Electromyography & Dynamometry
<b>Week 6</b>	Lab 6: Electrocardiography
<b>Week 7</b>	Lab 7: exam
<b>Week 8</b>	Lab 8: Ventilation & Spirometry
<b>Week 9</b>	Lab 9 : Urinalysis
<b>Week10</b>	Lab10: View film "Fed Up", food diary assigned
<b>Week11</b>	Lab11: Physiology of Adiposity; SOS of lab instructor
<b>Week12</b>	Lab12: Lower extremely bones
<b>Week13</b>	Lab13: Muscles tissue and skin
<b>Week14</b>	Lab14: The brine
<b>Week15</b>	review before final exam



Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Human from Cells to Systems. Sherwood, L. (2016, 9th edition) Cengage Learning.	no
Recommended Texts	<a href="https://training.seer.cancer.gov/linksre/">https://training.seer.cancer.gov/linksre/</a>	yes
Websites	<a href="https://www.ucc.ie/en/physiology/courses/physiologyasamodule/">https://www.ucc.ie/en/physiology/courses/physiologyasamodule/</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
	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
<p><b>Note:</b> 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.</p>				



# MODULE DESCRIPTION FORM

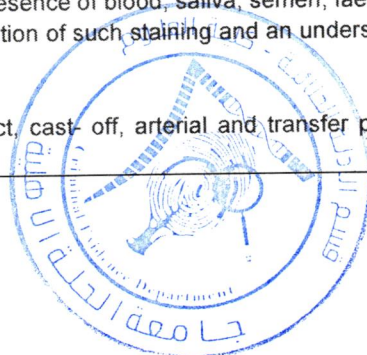
Module Information			
<b>Module Title</b>	Fundamentals of Fluids Detection and Secretions		<b>Module Delivery</b>
<b>Module Type</b>	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
<b>Module Code</b>	FOR23016		
<b>ECTS Credits</b>	6		
<b>SWL (hr/sem)</b>	150		
<b>Module Level</b>	2	<b>Semester of Delivery</b>	
<b>Administering Department</b>	FOR	<b>College</b>	Science
<b>Module Leader</b>	M.Sc. Adel Sabah Abduljaleel	<b>e-mail</b>	Adel85hind89@gmail.com
<b>Module Leader's Acad. Title</b>	Assistant lecturer	<b>Module Leader's Qualification</b>	
<b>Module Tutor</b>	M.Sc. Adel Sabah Abduljaleel	<b>e-mail</b>	Adel85hind89@gmail.com
<b>Peer Reviewer Name</b>	M.Sc. Adel Sabah Abduljaleel	<b>e-mail</b>	Adel85hind89@gmail.com
<b>Scientific Committee Approval Date</b>	10/12/2025	<b>Version Number</b>	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	
<p><b>Module Aims</b></p> <p>أهداف المادة الدراسية</p>	<p>The aim of this Module is :</p> <p>1-to provide the student with an understanding of examination strategies for the range of body fluids encountered in forensic biology casework together with the science underpinning the interpretation of bloodstain patterns.</p> <p>2-An awareness of the contribution of selected areas of the biological sciences to specialised forensic science studies is also given.</p> <p>3-to provide a basic grounding in Forensic Criminology.</p> <p>4- to promote analytical and evaluative skills, as well as encourage the application of material to appropriate case studies.</p> <p>5- students will, through seminar work, applied approach and problem solving, develop a knowledge and understanding of the subject area, as well as an appreciation of the ethical and complex issues that surround forensic criminology.</p>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>By the end of this module the student should be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the rationale for undertaking different body fluid examinations as an aid to crime investigation.</li> <li>2. Relate the biological characteristics of different body fluids to the methods used for location and identification in the forensic laboratory.</li> <li>3. Identify and interpret bloodstain patterns and relate these to a theoretical treatment of blood dynamics.</li> <li>4. Have a basic understanding of how the results of biological examinations are used in the context of case interpretation.</li> <li>5. Analyse and critically evaluate the contribution of selected areas of biology to specialised aspects of forensic science.</li> <li>6. Explain the analytical, laboratory and legal requirements of producing DNA STR profiles.</li> <li>7. Perform interpretation of DNA STR profiling results, including calculation of likelihood ratios.</li> <li>8. Critically evaluate DNA STR profiling results citing significant research in the field.</li> <li>9. Show an understanding of the scientific basis and utilisation of techniques of bone anthropometry and pathology in the study of human tissue.</li> <li>10. Demonstrate the ability to critically evaluate body fluid evidence and blood stain patterns.</li> </ol>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>1 Body Fluids Methods for detection and confirmation of the presence of blood, saliva, semen, faeces and urine. Interpretation of the presence and distribution of such staining and an understanding of body fluid persistence.[18h]</p> <p>2 Blood Dynamics and Blood Stain Patterns Rheology of blood and blood behaviour. Impact, cast-off, arterial and transfer patterns, interpretation and evidential value.[18h]</p>

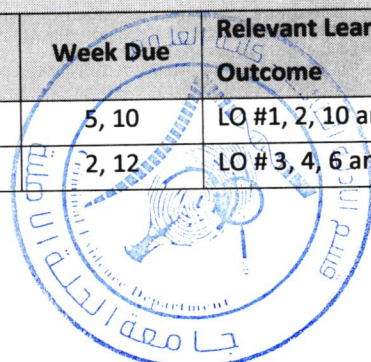


	<p>3 Selected Areas of Biology Relevant to Forensic Science For example: aspects of entomology, trichology and other specialist areas of forensic biology may be considered.[15h]</p> <p>4:Forensic Psychology: the social context of crime; what is forensic and criminal psychology; serial killing; profile analysis: investigative psychology and statistical profiling; false confessions; false allegations; eye witness testimony; lies, detection and credibility; psychology in prison; assessing risk and dangerousness.[15h]</p> <p>5:Criminal Investigation: Introduction to forensic science; the crime scene; trace and contact evidence: recoverable materials; trace and contact evidence: fingerprints; analysing body fluids; DNA profiling; fires; examination of human remains; questioned documents; forensic science in court and presenting evidence to a jury.[20h]</p>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	This module covers a wide variety of theoretical, conceptual and practical areas, which require a range of knowledge and skills at a more advanced level to be displayed and exercised. Delivery of its syllabus content therefore involves a diversity of teaching and assessment methods suitable to the learning outcomes of the module; these include formal lectures, structured tutorials (work closely integrated with the lecture material), practical exercises, and completion and submission of written coursework making use of appropriate forms of IT and VLE, and independent study.

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	86	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	6.2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	64	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

<b>Module Evaluation</b> 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)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	<b>Material Covered</b>
<b>Week 1</b>	Introduction in blood and body fluid
<b>Week 2</b>	Bile composed and liver enzymes
<b>Week 3</b>	Brest milk composition
<b>Week 4</b>	Cerebral spinal fluid
<b>Week 5</b>	Digestive system secretion, Saliva, mucus
<b>Week 6</b>	Amniotic fluid characteristic
<b>Week 7</b>	Mucus secretion and nasal drainage
<b>Week 8</b>	Peritoneal fluid
<b>Week 9</b>	Skin, sweating gland
<b>Week 10</b>	Eyes, tears secretion
<b>Week 11</b>	Seminal fluid
<b>Week 12</b>	Urine analysis
<b>Week 13</b>	Vomiting
<b>Week 14</b>	Vaginal secretion
<b>Week 15</b>	Exam
<b>Week 16</b>	Preparatory week before the final Exam

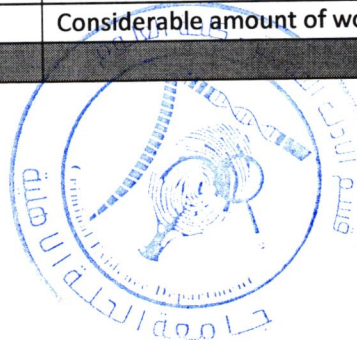
<b>Delivery Plan (Weekly Lab. Syllabus)</b> المنهاج الاسبوعي للمختبر	
	<b>Material Covered</b>
<b>Week 1</b>	Lab 1: Lab Safety
<b>Week 2</b>	Lab 2: Blood investigation and body fluid analysis
<b>Week 3</b>	Lab 3: Bile composed and liver enzymes investigation



<b>Week 4</b>	Lab 4: Breast secretion
<b>Week 5</b>	Lab 5: Determination the CSF component
<b>Week 6</b>	Lab 6: Investigate the secretion of digestive system, Saliva, mucus
<b>Week 7</b>	Lab 7: Exam
<b>Week 8</b>	Lab 8: Amniotic fluid
<b>Week 9</b>	Lab 9 : Mucus secretion and nasal drainage
<b>Week 10</b>	Lab10:Peritoneal fluid
<b>Week 11</b>	Lab11:Skin, sweating gland
<b>Week 12</b>	Lab12:Eyes, tears secretion
<b>Week 13</b>	Lab13:Seminal fluid
<b>Week 14</b>	Exam
<b>Week 15</b>	<b>Review week</b>

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	Essential Haematology. Hoffbrand A.V., Pettit J.E. & Moss P.A.H., Blackwell, ISBN: 0632051541	NO
<b>Recommended Texts</b>	Flesh and Bone: An Introduction to Forensic Anthropology. Naftali M., Carolina Academic Press, ISBN:0890896380	yes
<b>Websites</b>	<a href="https://modules.abertay.ac.uk/module.cfm?modcode=FOR301&amp;term=S1">https://modules.abertay.ac.uk/module.cfm?modcode=FOR301&amp;term=S1</a>	

<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.



# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Genetics		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	FOR23114		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	
Administering Department	FORN	College	SC
Module Leader	Ruqaya Yahya Abd AL-Shaheed	e-mail	ruqayyah_yahya@hilla-unc.edu.iq
Module Leader's Acad. Title	Lecturer Dr.	Module Leader's Qualification	Lec. Dr.
Module Tutor	Ruqaya Yahya Abd AL-Shaheed	e-mail	ruqayyah_yahya@hilla-unc.edu.iq
Peer Reviewer Name	Name	e-mail	
Scientific Committee Approval Date	21/12/2025	Version Number	1.0

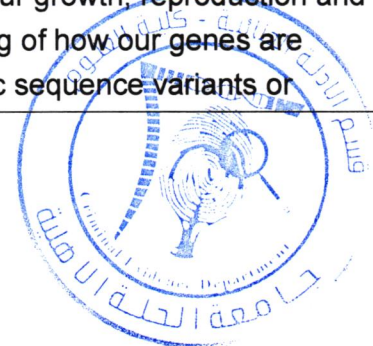
Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	FOR 23114 (Genetics)	Semester	2/1
Co-requisites module	None	Semester	



## Module Aims, Learning Outcomes and Indicative Contents

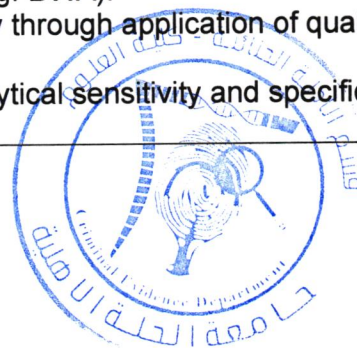
### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>1-genetics begins with scientific research, which translates through clinical practice to touch the lives of patients and families with genetic disease on a daily basis.</p> <p>2- This module aims to provide a lens through which to view the core aspects of this multidisciplinary subject, describing how and why genetics is important in the development, diagnosis and treatment of disease.</p> <p>3-focus firstly on the basics of how genetic material is replicated, curated, and inherited, to enable an understanding of how genetic sequence variants lead to genetic disease, or to susceptibility to complex diseases.</p> <p>4-Genetic research and disease often raises challenging ethical questions and considerations, which will also be explored in the module You will also explore the molecular mechanisms by which genes are regulated alongside the contribution and role of environment influences.</p> <p>5- Overall the module link clinical genetics practice with internationally-leading research strengths at CMH, to provide a holistic view of medical genetics from the scientific, clinical and patient perspectives.</p>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<p>On successfully completing the module you will be able to...</p> <ol style="list-style-type: none"><li>1. Describe in some detail and discuss the cellular and molecular basis of inheritance</li><li>2. Explain the differences between acquired, monogenic, polygenic and epigenetic disease</li><li>3. Explain the different mechanisms by which genes are regulated in humans</li><li>4. Discuss the contribution of genetics and environment to disease processes in humans</li><li>5. Show awareness of, and discuss the ethical issues in modern genetics</li><li>6. Discuss with examples the importance of interaction between patients, scientists and clinician</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Our genetics influence every aspect of our growth, reproduction and health. Due to this, a deep understanding of how our genes are inherited and regulated, and how genetic sequence variants or</p>



	<p>epigenetic factors affect gene function is crucial for understanding normal human development, and the basis of genetic diseases.[16h]</p> <p>Knowing how molecular pathways function and are altered by gene variants is important to identify molecular biomarkers to monitor disease onset and progression, and define new therapies to treat disease. For example, research studies have detailed how breast cancer risk is greatly increased by the inheritance of specific <i>BRCA1</i> gene variants, and discovered that some patients with maturity-onset diabetes of the young (MODY) may transfer from insulin injections onto sulphonylurea tablets taken orally. [16h]</p> <p>Thus medical genetics as practiced today involves close scientific, clinical and patient interaction. This module describes how genomic research and clinical genetic services work in close synergy to deliver modern diagnostic and clinical genetic services, and discusses some of the ethical challenges and considerations, as well as patient perspectives, associated with this ever increasingly important discipline.[16h]</p> <p>Genetics provides an introduction to both classical and modern molecular genetics. We start by looking at Mendelian genetics, including consideration of how genetic maps are created and an introduction to human pedigrees. We then examine the basic mechanisms of transcription and translation and how gene expression can be regulated. The module concludes by considering the molecular tools that geneticists use and how these have been used to uncover the content of diverse genomes.[16h]</p>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<ul style="list-style-type: none"> <li>• Aligning genome data to reference sequence using up to date alignment programmes (e.g. BWA).</li> <li>• Assessment of data quality through application of quality control measures.</li> <li>• How to determine the analytical sensitivity and specificity of genomic tests.</li> </ul>



- Use of tools to call sequence variants e.g. GATK, annotation of variant-call files using established databases.
- Filtering strategies of variants, in context of clinical data, and using publicly available control data sets
- Use of multiple database sources, in silico tools and literature for pathogenicity evaluation, and familiarisation with the statistical programmes to support this.
- Principles of integration of laboratory and clinical information, and place of best practice guidelines for indicating the clinical significance of results.

### Student Workload (SWL)

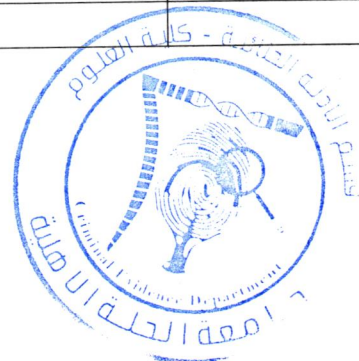
الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	86	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	6
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	81	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

### Module Evaluation

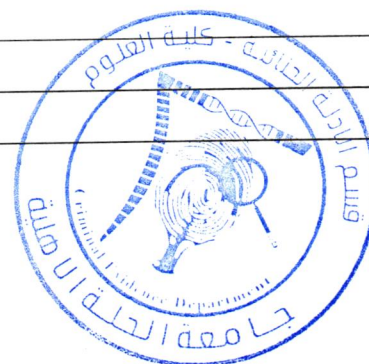
تقييم المادة الدراسية

		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)		



<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	<b>Material Covered</b>
<b>Week 1</b>	Introduction - Introduction to genetic
<b>Week 2</b>	Classical Mendelian genetics
<b>Week 3</b>	The population genetic
<b>Week 4</b>	Human genome
<b>Week 5</b>	Functions of gene and chromosome
<b>Week 6</b>	Mitosis and meiosis genetic code
<b>Week 7</b>	Genetic variation
<b>Week 8</b>	Gene flow and new species
<b>Week 9</b>	Mutation and chromosomal abnormalities
<b>Week 10</b>	Medical genetic diseases
<b>Week 11</b>	Karyotype, Banding techniques
<b>Week 12</b>	Mutagens and carcinogens
<b>Week 13</b>	Autosomal dominant inheritance
<b>Week 14</b>	Autosomal recessive inheritance
<b>Week 15</b>	Exam
<b>Week 16</b>	Preparatory week before the final Exam

<b>Delivery Plan (Weekly Lab. Syllabus)</b> المنهاج الاسبوعي للمختبر	
	<b>Material Covered</b>
<b>Week 1</b>	Lab 1: Organisms supported as a model system for genetics
<b>Week 2</b>	Lab 2: The first law of Mendel and the deviations from Mendel's first law
<b>Week 3</b>	Lab 3: The second law of Mendel and the deviation from Mendel's second law
<b>Week 4</b>	Lab 4: The quantitative inheritance
<b>Week 5</b>	Lab 5: Genetics and sex
<b>Week 6</b>	Lab 6: Link and crossing over
<b>Week 7</b>	Lab 7: Cases of crossing over suppression
<b>Week 8</b>	Lab 8: Genetic mapping
<b>Week 9</b>	Lab 9: Mutation and chromosomal abnormalities



<b>Week 10</b>	Lab 10: Medical genetic diseases
<b>Week 11</b>	Lab 11: Karyotype, Banding techniques
<b>Week 12</b>	Lab 12: Mutagens and carcinogens
<b>Week 13</b>	Lab 13: Autosomal dominant inheritance
<b>Week 14</b>	Lab 14: Autosomal recessive inheritance
<b>Week 15</b>	Exam

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	FReece J, Urry L, Cain M, Wasserman S, Minorsky P, Jackson, R. (Eds) 9th Global Edition, 2011, Campbell Biology, Pearson Benjamin Cummings.	Yes
<b>Recommended Texts</b>	Butler, J. (2005) Forensic DNA Typing 2nd Ed. Elsevier (MA) ISBN: 9780121479527 Forensic Science – Jackson A.R. & Jackson J., Prentice Hall, ISBN: 130432512	No
<b>Websites</b>	Cochrane reviews: <a href="http://www.cochrane.org/cochrane-reviews">http://www.cochrane.org/cochrane-reviews</a> Pubmed/MedLine: <a href="http://www.ncbi.nlm.nih.gov/pubmed">http://www.ncbi.nlm.nih.gov/pubmed</a>	

<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
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<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.

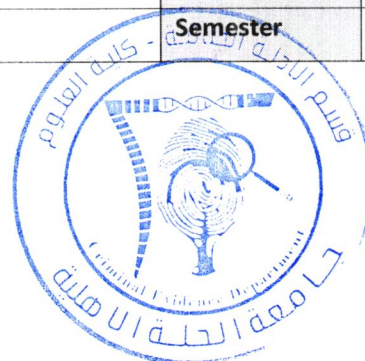


# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	chemistry		Module Delivery
Module Type	Core		<input checked="" 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	FOR1102		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	1	Semester of Delivery	
Administering Department	FOR	College	Type College Code
Module Leader	Mariam Hamid Abdulsattar	e-mail	Mariam.Hamid.Abdulsattar@uomus.edu.iq
Module Leader's Acad. Title	Assistant lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	Mariam Hamid Abdulsattar	e-mail	Mariam.Hamid.Abdulsattar@uomus.edu.iq
Peer Reviewer Name	Mariam Hamid Abdulsattar	e-mail	Mariam.Hamid.Abdulsattar@uomus.edu.iq
Scientific Committee Approval Date	12/12/2025	Version Number	1.0

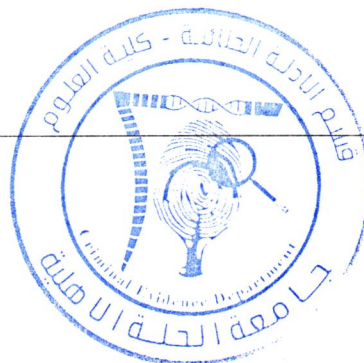
Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	



## 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-To develop skills and understanding of different types of elements through the application of techniques.</li><li>2. To understand metals, physical and chemical properties.</li><li>3. This course deals with the basic concept of general chemistry.</li><li>4. To understand periodic table and distribution elements on it</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Recognize the classification of elements.</li><li>2. List the various terms associated with periodic table.</li><li>3. Summarize what is meant by a basic chemical property.</li><li>4. Discuss the reaction and involvement of atoms in chemical reaction.</li><li>5. Describe bonds, oxidation number, and Lewis term.</li><li>6. Identify the elements according to conductivity and their applications.</li><li>7. Discuss the electrons distribution in the atomic levels.</li><li>8. Identify the primary terms that used to characterized physical and chemical properties.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p>Part A-Circuit Theory Starting from atomic theory and electron distribution in the outer and inner shells the details required make enough information for the principle of chemistry. [15hrs]</p> <p>Enhance the principle of general chemistry when highlight in more information about losing and acceptance electrons with the abilities for forming any bonds and forming new molecules with new properties. [16hrs]</p> <p>Periodic table with highlight in the orientations of molecules to show different and variance in properties. [12hrs]</p> <p>Revision problem classes [6hrs]</p> <p>Part B-Analogue chemistry</p> <p>3-Fundamentals Electron configuration, oxidation number, The ratios of forming molecules. [15hrs]</p> <p>Components and active site. [9hrs]</p> <p>Identification of general properties.[9hrs]</p>



## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<p>To describe the learning activities of the students and the teaching methods of the staff. Effective module design should result in a varied range of active learning experiences for students, including learning activities which are 'research-like'.</p> <p>Activities should, of course, motivate and encourage deep learning (reflection on wider meanings, rather than superficial memorisation of information). They should also be varied and flexible enough to accommodate different learning styles and orientations, and allow for inclusivity of students from different backgrounds and with different kinds of learning abilities.</p> <p>Learning activities therefore need to include reference to independent, interdependent (peer- supported) and online activities, as well as participation in different kinds of taught class.</p>
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## Student Workload (SWL)

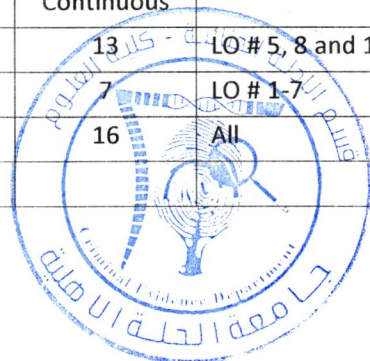
### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	86	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	6.1
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	89	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	6.3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	175		

## 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 Syllabus)

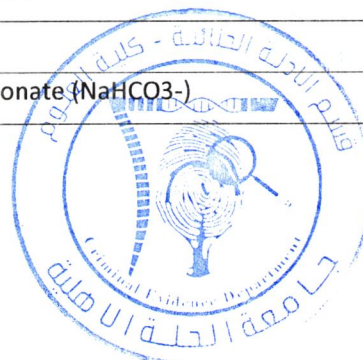
المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Introduction to chemistry
<b>Week 2</b>	Periodic table
<b>Week 3-4</b>	Atomic structure types of bonding
<b>Week 5</b>	Physical and chemical properties/ Drawing Lewis Structures
<b>Week 6</b>	Chemical Reactions
<b>Week 7</b>	Preparation solution (types of concentration)
<b>Week 8</b>	Exam
<b>Week 9-10</b>	Acids and Bases and titration
<b>Week 11-12</b>	Titrimetric Methods
<b>Week 13-14</b>	Separation method of elements
<b>Week 15</b>	Preparatory week before the final Exam

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	Lab 1: General safety rules for Laboratory and equipments
<b>Week 2</b>	Lab 2: Standard Solution
<b>Week 3</b>	Lab 3: Preparation of standard solution from liquid solutions
<b>Week 4</b>	Lab 4: Preparation of standard solution from solid materials
<b>Week 5</b>	Lab 5: Titration Strong Acid with Strong Base
<b>Week 6</b>	Lab 6: Titrating Sodium Carbonate With Hydrochloric Acid
<b>Week 7</b>	Lab 7: pH - Metric Titration
<b>Week 8</b>	Lab 8 : exam
<b>Week 9</b>	Lab 9 : Conductometric Titrating of Strong Acid With Strong Base
<b>Week 10</b>	Lab 10: Titration of Acetic Acid in Vinegar
<b>Week 11</b>	Lab 11: Titration of a Mixture of Carbonate ( $\text{CO}_3^{2-}$ ) and Bicarbonate ( $\text{NaHCO}_3^-$ )

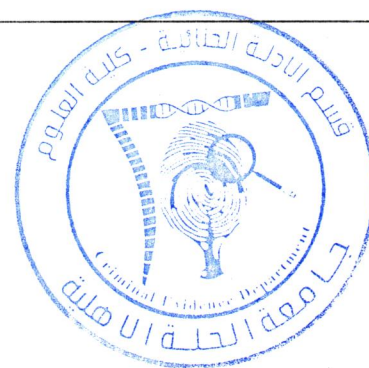


<b>Week 12-13</b>	Lab 12: Separation of I Group Cations (Ag+, Pb2+, Hg22+)
<b>Week 14</b>	Lab 14: exam
<b>Week 15</b>	Review All Previous Experiences

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	A Textbook of Physical Chemistry Vol-6 Kapoor, K.L Mc Graw-Hill 2019	Yes
<b>Recommended Texts</b>	Introductory Chemistry Essentials, Global Edition Tro, N. J. Pearson 2015	yes
<b>Websites</b>	<a href="https://openstax.org/details/books/chemistry-2e">https://openstax.org/details/books/chemistry-2e</a> <a href="https://open.umn.edu/opentextbooks/textbooks/219">https://open.umn.edu/opentextbooks/textbooks/219</a>	

<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.



# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	General Biology		Module Delivery
Module Type	Core		<input checked="" 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	FOR1101		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	1	Semester of Delivery	
Administering Department	FOR	College	Science
Module Leader	Ghouson Ghassan kareem	e-mail	Ghusun_ghassan@hilla-unc.edu.iq
Module Leader's Acad. Title	Assistant lecturer	Module Leader's Qualification	MSC
Module Tutor	Ghouson Ghassan kareem)	e-mail	E-mail
Peer Reviewer Name	Ghouson Ghassan Kareem <i>Ghouson Ghassan Kareem</i>	e-mail	Ghusun_ghassan@hilla-unc.edu.iq
Scientific Committee Approval Date	14/12/2025	Version Number	1.0

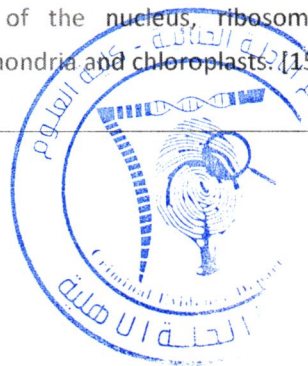
Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	



## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"><li>1. This module gives students an understanding of the science and techniques that underpin forensic biology.</li><li>2. Topics covered will include identification of biological fluids, the analysis the human genome in forensic biology, blood stain pattern analysis and forensic anthropology.</li><li>3. Material covered in lectures will be illustrated through lab work.</li><li>4. Highlight in most theories that was deal with biology system for live.</li><li>5. Our aim is to provide students with opportunities to develop academically, professionally and personally: to broaden their ambitions, extend their attitudes, challenge their assumptions, and assist towards unlocking their potential to succeed in their studies and future lives.</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Explain the analytical, laboratory and legal requirements of producing DNA profiles.</li><li>2. Summarize what is meant by a basic biology science.</li><li>3. Perform interpretation of DNA profiling results, including calculation of likelihood ratios.</li><li>4. Critically evaluate DNA profiling results citing significant research in the field.</li><li>5. Show an understanding of the scientific basis and utilisation of techniques of bone anthropometry and pathology in the study of human tissue.</li><li>6. Demonstrate the ability to critically evaluate body fluid evidence and blood stain patterns.</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>On completion of this module, students are expected to be able to:</p> <ol style="list-style-type: none"><li>1 Demonstrate knowledge of the basic structures, functions and growth characteristics of cells.[13h]</li><li>2 Demonstrate knowledge of the structure and function of the four principal tissue types.[13h]</li><li>3 Demonstrate an understanding of Mendelian genetic inheritance. [15hrs]</li></ol> <p>Demonstrate understanding of the role of variation in speciation and evolution. [15 hrs]</p> <p>Evolution of the eukaryotic cell, membrane structure and membrane transport mechanisms, structure and function of the nucleus, ribosomes, endoplasmic reticulum, Golgi Body, lysosomes, mitochondria and chloroplasts. [15 h]</p>

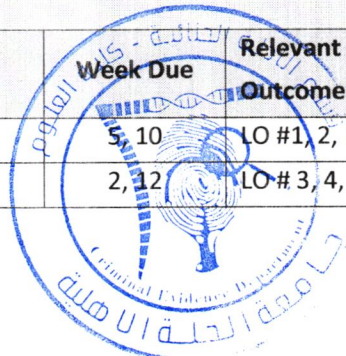


	Mitosis and meiosis. Structure and function of epithelial, connective, nervous and muscle tissue. Mendel's Laws, inheritance, genotype, phenotype, dominance, sex determination, sex-linkage, variation, speciation and evolution.. [15 hrs]
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<p>To describe the learning activities of the students and the teaching methods of the staff. Effective module design should result in a varied range of active learning experiences for students, including learning activities which are 'research-like'.</p> <p>Activities should, of course, motivate and encourage deep learning (reflection on wider meanings, rather than superficial memorisation of information). They should also be varied and flexible enough to accommodate different learning styles and orientations, and allow for inclusivity of students from different backgrounds and with different kinds of learning abilities.</p> <p>Learning activities therefore need to include reference to independent, interdependent (peer- supported) and online activities, as well as participation in different kinds of taught class.</p>

<b>Student Workload (SWL)</b> الحمل الدراسي للطلاب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطلاب خلال الفصل	86	<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	89	<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	175		

<b>Module Evaluation</b> 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 Syllabus)

المنهاج الاسبوعي النظري

	<b>Material Covered</b>
<b>Week 1</b>	Course introduction; What is biology?
<b>Week 2</b>	The nature of life
<b>Week 3</b>	Atomic structure and chemistry of water
<b>Week 4</b>	Carbohydrates, proteins, and lipids
<b>Week 5</b>	Nucleic acids
<b>Week 6</b>	Exam Mid-term Exam
<b>Week 7</b>	Cells, Part I
<b>Week 8</b>	Cells, Part 2
<b>Week 9</b>	Energy & metabolism, Part I
<b>Week 10</b>	Energy & metabolism, Part 2
<b>Week 11</b>	Cellular respiration, Part I
<b>Week 12</b>	Cellular respiration, Part 2
<b>Week 13</b>	Photosynthesis
<b>Week 14</b>	DNA & its role in heredit
<b>Week 15</b>	EXAM
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	<b>Material Covered</b>
<b>Week 1</b>	Lab 1: Introduction to Measurement
<b>Week 2</b>	Lab 2: Course intro; Life and the scientific theory
<b>Week 3</b>	Lab 3: Enzyme function I



<b>Week 4</b>	Lab 4: Enzyme function 2
<b>Week 5</b>	Lab 5: Microscope & cell structure
<b>Week 6</b>	Lab 6: Cell behavior
<b>Week 7</b>	Lab 7: Respiration
<b>Week 8</b>	Lab 8 : Photosynthesis
<b>Week 9</b>	Lab 9 : Restriction digest of plasmids
<b>Week 10</b>	Lab 10: Gene transformation
<b>Week 11</b>	Lab 11: Mitosis, meiosis, and gametogenesis
<b>Week 12</b>	Lab 12: Mendelian crosses
<b>Week 13</b>	Lab 13: Outcomes of evolution
<b>Week 14</b>	Lab 14: Blood Typing
<b>Week 15</b>	Exam

### Learning and Teaching Resources

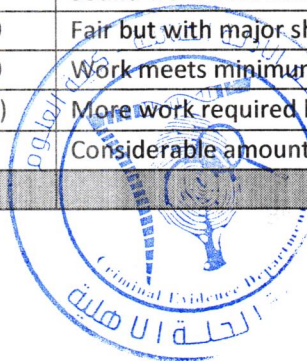
مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Freece J, Urry L, Cain M, Wasserman S, Minorsky P, Jackson, R. (Eds) 9th Global Edition, 2011, Campbell Biology, Pearson Benjamin Cummings.	Yes
<b>Recommended Texts</b>	Butler, J. (2005) Forensic DNA Typing 2nd Ed. Elsevier (MA) ISBN: 9780121479527 Forensic Science – Jackson A.R. & Jackson J., Prentice Hall, ISBN: 130432512	No
<b>Websites</b>	<a href="https://www.aqa.org.uk/subjects/science/as-and-a-level/biology-7401-7402/subject-content">https://www.aqa.org.uk/subjects/science/as-and-a-level/biology-7401-7402/subject-content</a>	

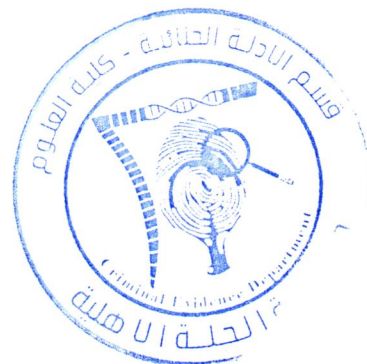
### Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<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.

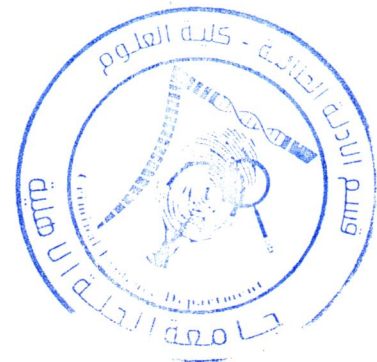


# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	General Physics		Module Delivery
Module Type	Support		<input checked="" 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	MBO 11003		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	2
Administering Department	Forensic	College	Science
Module Leader	Fatima Mohammed Dridan	e-mail	fatima.mohammed@hilla-unc.edu.iq
Module Leader's Acad. Title		Module Leader's Qualification	M.s.c
Module Tutor	N.A	e-mail	fatima.mohammed@hilla-unc.edu.iq
Peer Reviewer Name		e-mail	fatima.mohammed@hilla-unc.edu.iq
Scientific Committee Approval Date	16/12/2025	Version Number	1.0

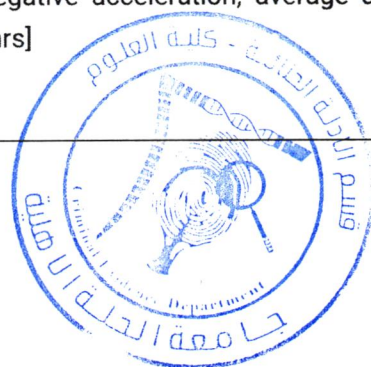
Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	



## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

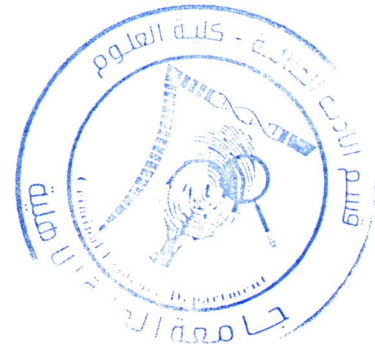
<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"><li>1. To have knowledge about General Physics basic principles like Mechanics of motion, liquid mechanics and electricity.</li><li>2. To get skills in solving mathematical problems that related to physics subjects.</li><li>3. To get practical skills in managing physics experiments in the lab. and record measurements and then calculate required quantities.</li><li>4. Analysis the physical information in syllabus and be able to make conclusions by joining between physical concepts.</li><li>5. To be able to apply his knowledge in physics in market.</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Save in memory basic principles and laws of physics.</li><li>2. Produce scientific concepts by joining between physical principles.</li><li>3. Joining physical concepts to produce more complicated concepts.</li><li>4. The ability to make conclusions by analysis the physical information.</li><li>5. The ability to apply all his knowledge to solve problems in reality.</li><li>6. To be able to run the devices and apparatus in the lab.</li><li>7. Assemble devices and make an experiment to prove physical relation.</li><li>8. Discuss the results get from running experiment in the lab.</li><li>9. Make reports from theory to conclusion about any physical concept proved in the lab.</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Measurement units, Motion in one dimension, path and displacement, velocity and acceleration. [9 hrs]</p> <p>Free fall motion, gravity, projectile path. [8 hrs]</p> <p>Vector Analysis, Unit vector, Vector addition and subtraction, resultant vector and its direction. [10 hrs]</p> <p>Motion in two dimensions, concept of negative acceleration, average and instantaneous velocity and acceleration. [9 hrs]</p> <p>Revision problem classes [5 hrs]</p>



	<p>Newton laws of motion, principle of continuity, equilibrium, action and reaction, force analysis diagraph. [12 hrs]</p> <p>Circuits and electricity, Current, Voltage, Resistance. [10 hrs]</p> <p>Fluid Mechanics, Pascal principle, Archimedes principle, Pressure, Bernoulli equation in fluid flow. [9 hrs]</p>
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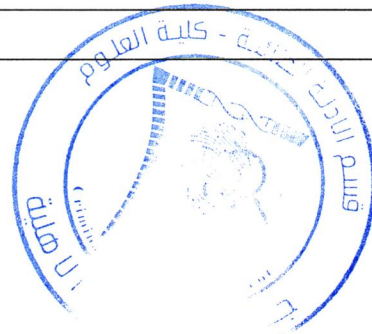
<b>Learning and Teaching Strategies</b> <b>استراتيجيات التعلم والتعليم</b>	
<b>Strategies</b>	<p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes and by considering type of simple experiments involving some sampling activities that are interesting to the students.</p>

<b>Student Workload (SWL)</b> <b>الحمل الدراسي للطالب</b>			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	72	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5.1
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	78	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		



Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	2,4,6,10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	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	Physical unit systems and unit conversion
Week 2	Motion in one dimension: velocity and acceleration
Week 3	Free fall motion and gravity
Week 4	Vector analysis: vector addition and subtraction
Week 5	Unit vector and vector resultant calculation
Week 6	Motion in two dimension: velocity and acceleration calculations
Week 7	Mid-term Exam
Week 8	Newton first law of motion: object in equilibrium concept
Week 9	Newton second law of motion: acceleration and deceleration
Week 10	Newton third law of motion: action and reaction
Week 11	Electricity: current, voltage and resistance, Ohm's law
Week 12	Electric circuits: series and parallel circuits
Week 13	Fluid mechanics: pressure and Pascal Principle
Week 14	Archimedes principle
Week 15	Bernoulli equation in fluid flow
Week 16	Preparatory week before the final Exam



## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to diagrams and report writing
Week 2	Lab 2: Surface tension
Week 3	Lab 3: Force equilibrium
Week 4	Lab 4: Static and dynamic friction
Week 5	Lab 5: Ohm's law
Week 6	Lab 6: Series and Parallel circuits
Week 7	Lab 7: Density of materials

## Learning and Teaching Resources

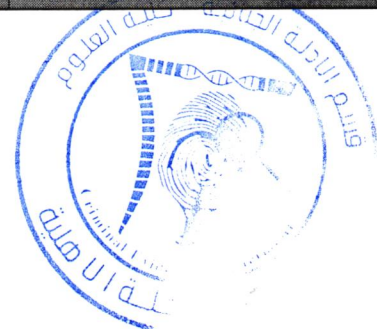
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Applied Physics by Schaum 2013	No
Recommended Texts	Physics for scientists and engineers by Serway 2004.	No
Websites	<a href="https://www.coursera.org/browse/physical-science-and-engineering">https://www.coursera.org/browse/physical-science-and-engineering</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
	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	Introduction to Fuels and Fire Acceleration		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	FOR1209		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	1	Semester of Delivery	2
Administering Department	FOR	College	Science
Module Leader	M.Sc. Adel Sabah Abduljaleel	e-mail	Adel85hind89@gmail.com
Module Leader's Acad. Title	Assistant lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	M.Sc. Adel Sabah Abduljaleel	e-mail	Adel85hind89@gmail.com
Peer Reviewer Name	M.Sc. Adel Sabah Abduljaleel	e-mail	Adel85hind89@gmail.com
Scientific Committee Approval Date	11/12/2025	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

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>An experimental study of liquid fuel fires (Class B) in enclosures with Class A combustibles was conducted to 1) characterize the differences in fire dynamics and fire damage between ignitable liquid fuel fires in compartments versus in the open, and 2) to evaluate the reliability of fire patterns and fire debris sampling for ignitable liquid residue analysis. The experimental work included an evaluation of patterns within enclosure fires, including fuel spill patterns and clean burns and an analysis of calcination of gypsum wallboard. A reliable and accurate method of obtaining calcinations depth surveys with a new portable hand-held tool was developed. The utility of calcination depth surveys was evaluated with respect to assessing the compartment fire dynamics and fire origin. The impact of water spray on the accuracy of calcination depth measurements was also assessed. The persistence of ignitable liquid residue was evaluated in a controlled, small-scale environment and in full-scale enclosure fires to identify optimum sampling locations within a given scenario.</p>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<p>1. After reviewing this module , the student should be able to:</p> <ol style="list-style-type: none"><li>• List the different kinds of ignition and fuel</li><li>• Describe the various kinds of fuel and flames</li><li>• Understand the concept of flammability, and describe how different aspects of flammability are measured</li><li>• Discuss the means by which fire patterns are generated, and know which patterns are significant in origin determination</li><li>• Understand the critical role of oxygen in fully involved compartment fires</li><li>• Describe the three different kinds of fire models and their usefulness in fire investigation</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Liquid fuel spill/pool fires represent the initiating fire hazard in many applications ranging from accidents at industrial plants using combustible liquids to residential arson fires involving flammable fuels.</p> <p>Given the relevancy of such fires and broad range of potential scenarios, it is important to understand how liquid fuel fires develop and how to accurately calculate the fire size based on knowledge of the fuel type, quantity and the surface it is poured on. In addition, it is important to quantitatively correlate fire size to spill area and burn patterns. [5h]</p> <p>This understanding will afford the fire protection and investigation communities the ability to properly assess the potential hazards and forensically evaluate damage from fuel spill fire events. [6h]</p>

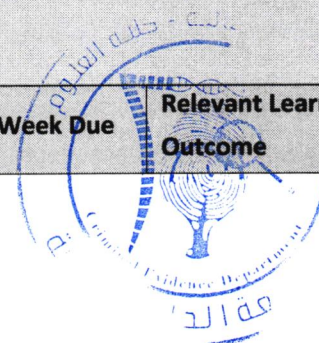


	<p>The purpose of this study is to expand the fundamental understanding of liquid fuel fire dynamics, establish the utility of forensic tools, and validate empirically-based correlations used to model spill fire scenarios.[11h]</p> <p>A multitude of small-, intermediate-, and large-scale noncombustible liquid spill and fuel spill fire tests were conducted using a total of six different liquid fuels and eight different substrates.[10h]</p> <p>The results of these tests provide insight into the differences in fire dynamics between pool and spill fires (i.e., thick and thin fuel depths), provide a methodology by which liquid fuel fire events can be assessed, and identify forensic indicators that can be used in the analysis of liquid fuel fire events. [10h]</p>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	The objectives of this research were achieved by way of small- and full-scale experiments combined with analytical testing and empirical-based analyses. 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.

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	58	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	3.4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	<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	75		

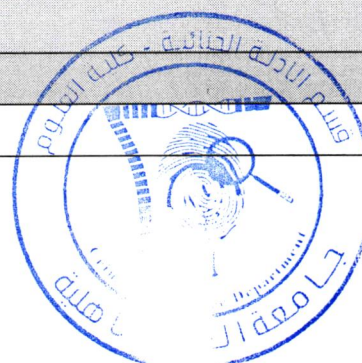
<b>Module Evaluation</b> تقييم المادة الدراسية			
	Time/Number	Weight (Marks)	Week Due Relevant Learning Outcome



<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)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	<b>Material Covered</b>
<b>Week 1</b>	History of solid fuels
<b>Week 2</b>	Protection, Present scenario and consumption pattern of fuels
<b>Week 3</b>	Fundamental definitions, properties and various measurements
<b>Week 4</b>	Coal classification, composition and basis
<b>Week 5</b>	Different types of coal combustion techniques
<b>Week 6</b>	Coal gasification
<b>Week 7</b>	Exploration of crude petroleum
<b>Week 8</b>	Refinery equipment's
<b>Week 9</b>	Gaseous fuel
<b>Week 10</b>	Water gas, hydrogen gas
<b>Week 11</b>	Acetylene, other fuel gas
<b>Week 12</b>	Combustion technology, fundamentals of thermochemistry
<b>Week 13</b>	Mechanism and kinetics of combustion,
<b>Week 14</b>	Mechanism and kinetics of Combustion furnaces, Internal combustion engine
<b>Week 15</b>	Exam
<b>Week 16</b>	Preparatory week before the final Exam

<b>Delivery Plan (Weekly tut. Syllabus)</b> المنهاج الاسبوعي للمختبر	
	<b>Material Covered</b>
<b>Week 1</b>	Lab 1: Introduction to Agilent VEE and PSPICE

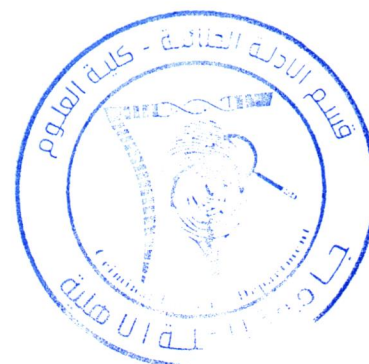


<b>Week 2</b>	Lab 2: Thévenin's / Norton's Theorem and Kirchhoff's Laws
<b>Week 3</b>	Lab 3: First-Order Transient Responses
<b>Week 4</b>	Lab 4: Second-Order Transient Responses
<b>Week 5</b>	Lab 5: Frequency Response of RC Circuits
<b>Week 6</b>	Lab 6: Frequency Response of RLC Circuits
<b>Week 7</b>	Lab 7: Filters

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	<b>Fire Dynamics and Forensic Analysis of Liquid Fuel Fires Paperback – August 9, 2012</b>	Yes
<b>Recommended Texts</b>	Forensic Analysis of Fire Debris and Explosives	No
<b>Websites</b>	<a href="https://www.ojp.gov/pdffiles1/nij/grants/238704.pdf">https://www.ojp.gov/pdffiles1/nij/grants/238704.pdf</a>	

<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.



# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Fundamental of Forensic Science		Module Delivery	
Module Type	Core		<input checked="" 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	FOR1106			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	1	Semester of Delivery	1	
Administering Department	FOR	College	Science	
Module Leader	M.Sc. Adel Sabah Abduljaleel		e-mail	Adel85hind89@gmail.com
Module Leader's Acad. Title	Assistant lecturer	Module Leader's Qualification	M.Sc.	
Module Tutor	M.Sc. Adel Sabah Abduljaleel		e-mail	Adel85hind89@gmail.com
Peer Reviewer Name	M.Sc. Adel Sabah Abduljaleel		e-mail	Adel85hind89@gmail.com
Scientific Committee Approval Date	10/12/2025	Version Number	1.0	

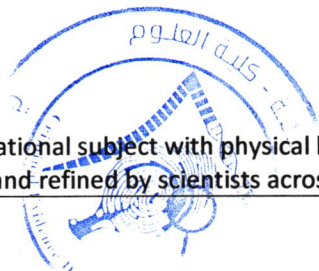
Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	



## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>1-Forensic Science is basically the application of science to law. 2-Forensic science is used to investigate criminal cases involving a victim, such as assault, robbery, kidnapping; rape, murder and civil cases such as forgeries, fraud, or negligence.</p>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<p>On successfully completing the module students will be able to:</p> <ol style="list-style-type: none"><li>1. Show understanding of the role of physical forensic methods in forensic practice.</li><li>2. Demonstrate knowledge of the primary evidence types, their transfer and persistence.</li><li>3. Demonstrate understanding of emerging developments in forensic science.</li><li>4. Consider a broad range of forensic techniques to determine the examination strategy, sequencing, and probative value.</li><li>5. Demonstrate understanding of quality standards in respect of scene examination.</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>A synopsis of the curriculum [15h]</p> <p>This module will develop students' appreciation of a range of physical techniques applied to the collection of bulk and trace evidence materials in forensic science. Students will look more deeply into aspects of physical evidence and will deal with the practical issues of item examination, legal process and general procedure associated with the collection and submission of a range of forensically-relevant materials.</p> <p>Inclusive module design [15h]</p> <p>The Division recognises and has embedded the expectations of current equality legislation, by ensuring that the module is as accessible as possible by design. Additional alternative arrangements for students with Inclusive Learning Plans (ILPs)/declared disabilities will be made on an individual basis, in consultation with the relevant policies and support services.</p> <p>The inclusive practices in the guidance (see Annex B Appendix A) have been considered in order to support all students in the following areas:</p> <ol style="list-style-type: none"><li>a) Accessible resources and curriculum</li><li>b) Learning, teaching and assessment methods</li></ol> <p>Internationalisation [14h]</p> <p>Forensic science is an inherently international subject with physical laws discovered and techniques developed and refined by scientists across</p>

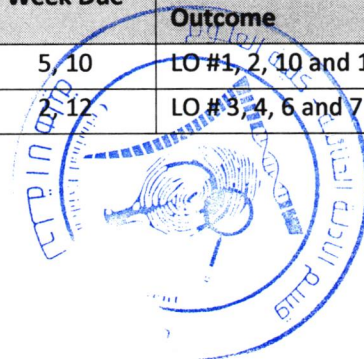


	<p>the globe. It is facilitated by well-defined conventions in terminology and mathematical modelling which allow complex concepts to be communicated across language barriers. This module introduces students to the work of these pioneers, as well as the fundamentals behind it and so enables them to interact with this community. Where possible, the reading list has been chosen, in part, to demonstrate the diversity of backgrounds of forensic scientists working in the field.</p>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<p>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.</p>

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	56	<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	44	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	3.1
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	100		

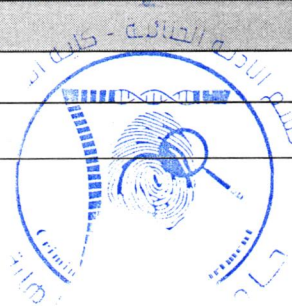
<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	<b>Assignments</b>	2	10% (10)	2, 12	LO #3, 4, 6 and 7



	<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)		

<b>Delivery Plan (Weekly Syllabus)</b>	
المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	مفهوم واهمية علم الادلة الجنائية
<b>Week 2</b>	التطور التاريخي للادلة الجنائية
<b>Week 3</b>	انواع الادلة الجنائية
<b>Week 4</b>	الادلة الجنائية والاثار المادية
<b>Week 5</b>	اهمية البصمة الواثية في تحقيق الشخصية
<b>Week 6</b>	البصمات واستخدام تقنية النانو في الكشف عنها
<b>Week 7</b>	لطب العدلي الشرعي
<b>Week 8</b>	الكيمياء الجنائية
<b>Week 9</b>	السموم الجنائية
<b>Week 10</b>	تزوير الجوازات وتزييف الاوراق النقدية
<b>Week 11</b>	فحص اثار الاسلحة والادوات
<b>Week 12</b>	مسرح الجريمة واجراءات المحافظة عليه
<b>Week 13</b>	الاداة الجنائية الالكترونية
<b>Week 14</b>	الهندسة الجنائية
<b>Week 15</b>	امتحان
<b>Week 16</b>	Preparatory week before the final Exam

<b>Delivery Plan (Weekly Lab. Syllabus)</b>	
المنهاج الاسبوعي للمختبر	
	Material Covered
<b>Week 1</b>	Lab 1: انواع الادلة الجنائية
<b>Week 2</b>	Lab 2: اهمية البصمة الواثية في تحقيق الشخصية



<b>Week 3</b>	البصمات واستخدام تقنية النانو في الكشف عنها: Lab 3
<b>Week 4</b>	الكيمياء الجنائية: Lab 4
<b>Week 5</b>	السموم الجنائية: Lab 5
<b>Week 6</b>	تزوير الجوازات وتزييف الاوراق النقدية: Lab 6
<b>Week 7</b>	مسرح الجريمة واجراءات المحافظة عليه: Lab 7

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
<b>Required Texts</b>	<b>Forensic Science: A very short introduction</b> by Jim Fraser	no
<b>Recommended Texts</b>	<b>Blood, Powder, and Residue (A rare behind-the-scenes look at the work of forensic scientists )</b> by Beth A. Bechky	No
<b>Websites</b>	<a href="https://www.nap.edu/read/21772/chapter/7">https://www.nap.edu/read/21772/chapter/7</a>	

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
<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.



## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	English language	Module Delivery	
Module Type	Suplement	<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	UNI 2-101		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	<u>1</u>		
Administering Department	FOR	College	Science
Module Leader	Ammar Hassan Obayes	e-mail	ammар_hassan@hilla-unc.edu.iq
Module Leader's Acad. Title	Asst. Lecturer	Module Leader's Qualification	Master of Arts
Module Tutor	Non	e-mail	....
Peer Reviewer Name	Non	e-mail	....
Review Committee Approval	16/3/2026	Version Number	



## Relation With Other Modules

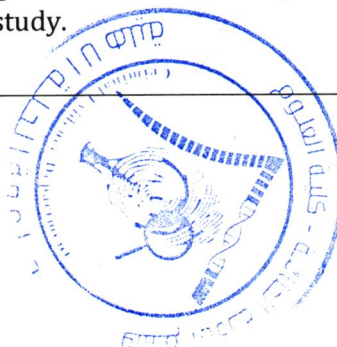
العلاقة مع المواد الدراسية الأخرى

<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. Enable students to learn how to read and pronounce words correctly, and training them to identify the organization of ideas through selected passages.</li><li>2. Training the students on different strategies of speaking skill.</li><li>3. Enable the student to identify word building, meanings, and sentence structure.</li><li>4. Enable students to understand the structures of writing and what is required to write a good academic essay.</li><li>5. Enable students to identify their weaknesses and strengths by assess their tests.</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Explanation and clarification of the lecture using the whiteboard and the use of video lectures.</li><li>2. Making a group discussion during the lectures to discuss topics that require reflection and analysis.</li><li>3. Presenting a set of critical thinking questions during the lectures such as what, how, when and why for specific topics.</li><li>4. Giving students homework that requires explanations and solving through reasonable methods.</li><li>5. Giving students homework that requires explanations in causal ways.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<ul style="list-style-type: none"><li>- The skills goals special to the course.</li><li>- Ability to independently investigate and resolve an original problem .</li><li>- Preparation for later advanced study.</li></ul>



## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

## Student Workload (SWL)

الحمل الدراسي للطالب

**Structured SWL (h/sem)**

الحمل الدراسي المنتظم للطالب خلال الفصل

**Structured SWL (h/w)**

الحمل الدراسي المنتظم للطالب أسبوعياً

**Unstructured SWL (h/sem)**

الحمل الدراسي غير المنتظم للطالب خلال الفصل

**Unstructured SWL (h/w)**

الحمل الدراسي غير المنتظم للطالب أسبوعياً

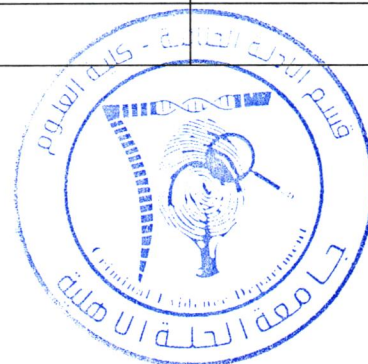
**Total SWL (h/sem)**

الحمل الدراسي الكلي للطالب خلال الفصل

## Module Evaluation

تقييم المادة الدراسية

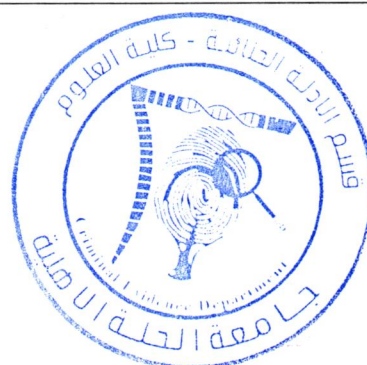
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5, 10	LO #3,4, 8 and 9
	<b>Assignments</b>	2	10% (10)	2, 12	LO # 2,11and 12
	<b>Report</b>	1	5% (5)	7	
	<b>Seminar</b>	1	15% (15)	13	
<b>Summative assessment</b>	<b>Midterm Exam</b>	1 hr	10% (10)	14	LO # 1-13
	<b>Final Exam</b>	3hr	50% (50)	15	All
<b>Total assessment</b>			100% (100 Marks)		



## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
Week 1	Reading/ the passage "The world of IT"
Week 2	Reading/ the passage "Information on the Net"
Week 3	Reading/ the passage "Science and our world"
Week 4	Vocabulary Development/ word-building (2)
Week 5	Writing an academic essay
Week 6	How to write a formal email
Week 7	Reading - Identify the organization of ideas
Week 8	Speaking// practicing conversation
Week 9	Developing strategies of speaking skill
Week 10	Improving communicative skills
Week 11	Forms and functions of clauses in English
Week 12	Sentence structure
Week 13	A review of what was studied in the previous lectures with questions and discussion of typical answers
Week 14	Mid Exam
Week 15	Final Exam



### Delivery Plan (Weekly Lab. Syllabus)

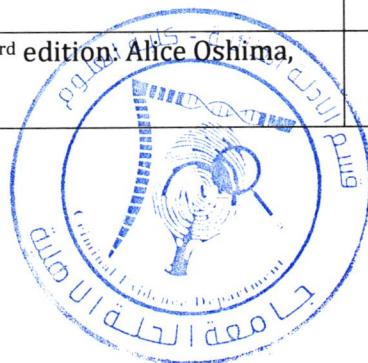
المنهاج الاسبوعي للمختبر

	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

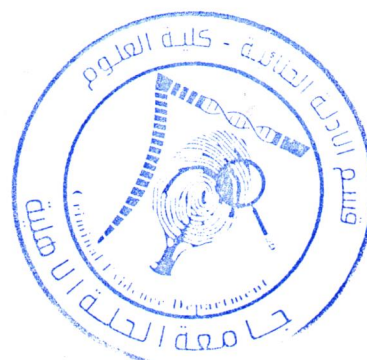
	Text	Available in the Library?
Required Texts	Headway- Academic skill-level 2: Sarah Philpot,2011	
Recommended Texts	Preparation course for the TOEFL TEST- Deborah Phillips, 2003.	
Recommended Texts	Headway- Upper intermediate- 3rd Edition: Liz and John Soars, 2005	
Recommended Texts	Introduction to Academic Writing – 3 <sup>rd</sup> edition: Alice Oshima, Ann Hogue	



**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.



# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Calculus 1		Module Delivery
Module Type	Core		<input checked="" 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	KUCA 006		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	1	Semester of Delivery	
Administering Department	Forensic	College	Science
Module Leader	Fatima Mohammed Dhidan	e-mail	fatima.mohammed@hilla-unc.edu.iq
Module Leader's Acad. Title		Module Leader's Qualification	M.s.c
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Fatima Mohamed	e-mail	fatima.mohammed@hilla-unc.edu.iq
Scientific Committee Approval Date	16/12/2025	Version Number	1.0

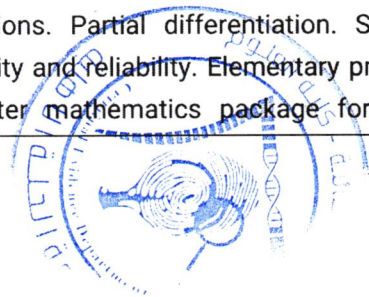
Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	



## 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. This module gives students an understanding of the principles of calculus can be give improve in forensic program.</li><li>2. To provide the student with the ability to apply introductory level mathematics to skills that deals with forensic science.</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<p>On completion of this module, students are expected to be able to:</p> <ol style="list-style-type: none"><li>1. Apply vectors, complex numbers and trigonometry to problems in mathematical program that could be used in forensics science.</li><li>2. Apply matrix techniques and elementary probability theory to problems in forensic.</li><li>3. Apply rules of calculus to solve forensic problems including differential equations.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p><u>Part A - primary information of calculus science</u></p> <p>On completion of this module, students are expected to be able to:</p> <ol style="list-style-type: none"><li>1 Trigonometry: Trigonometric identities and their application in solving trigonometric equations. [5h]</li><li>2 The combination of simple waveform using standard trigonometric formulae. Vectors: Simple vector algebra.[5h]</li><li>3 The scalar and vector products. Complex numbers: The arithmetic of complex numbers. Rectangular and polar forms. [12h]</li></ol> <p>Section 2</p> <ol style="list-style-type: none"><li>1 The Argand diagram. De Moivre's theorem and complex roots. Differential Calculus: Differentiation of elementary functions.</li><li>2 The rules of differentiation: chain rule, product rule, quotient rule. Integral Calculus: Integration of elementary functions. Partial fractions.[ 12h]</li></ol> <p>Application to problems in forensic . Matrices: Simple matrix algebra. Determinants. Applications to the solution of simultaneous linear equations. Differential Equations: Solution of 1st order ODEs by separation of variables and integration factor methods.[12h]</p> <p>Power series for elementary functions. Partial differentiation. Statistics: Simple descriptive statistics. Probability and reliability. Elementary probability distributions. The use of a computer mathematics package for solving</p>



	<p>problems in engineering mathematics. [10 hrs]</p> <p><u>Part B - essential and details</u></p> <p><b>Fundamentals</b></p> <p>To publicist the key learning resources that are important or essential for those studying the module or to demonstrate the academic foundation of the module. To provide a short list, indicating the type and level of information that students are expected to consult. Further, in depth, guidance and a comprehensive list of reading and resources should be made available . [15 hrs]</p> <p>Normally a short list of books or articles in reference format (author, date, title, and publisher). If a core text or textbook exists, this should be indicated. Lists should be indicative, rather than a full bibliography.. [7 hrs]</p> <p>To identify where the whole module may be taken by students at a distance, either by arrangement with the Programme Director or because it forms part of a programme that is wholly or partly delivered virtually. If distance learning is possible, a second module descriptor will need to be created, to identify learning, teaching, assessment and contact methods/support for students in the distance learning version of the module.. [15 hrs]</p>
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<b>Learning and Teaching Strategies</b> <b>استراتيجيات التعلم والتعليم</b>	
<b>Strategies</b>	<p>To describe the learning activities of the students and the teaching methods of the staff. Effective module design should result in a varied range of active learning experiences for students, including learning activities which are 'research-like'.</p> <p>Activities should, of course, motivate and encourage deep learning (reflection on wider meanings, rather than superficial memorisation of information). They should also be varied and flexible enough to accommodate different learning styles and orientations, and allow for inclusivity of students from different backgrounds and with different kinds of learning abilities.</p> <p>Learning activities therefore need to include reference to independent, interdependent (peer-supported) and online activities, as well as participation in different kinds of taught class.</p>



Student Workload (SWL)			
الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	51	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	49	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	6.5
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)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / tutorial.	1	10% (10)	Continuous	
	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)	
المناهج الأسبوعي النظري	
	Material Covered
Week 1	The rate of change of function
Week 2	Coordinates
Week 3	Increments
Week 4	Equation and slop of straight line
Week 5	Functions and graphs
Week 6	Ways of combining functions
Week 7	Exam
Week 8	Derivative of a functions, velocity and acceleration



Week 9	Limits
Week 10	The continuity
Week 11	Infinity functions
Week 12	Derivative of algebraic functions, polynomial, rational and inverse functions
Week 13	Composite functions and their derivative, Chain rule
Week 14	Roll's theorem
Week 15	Exam
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly tutorial. Syllabus)	
المنهاج الاسبوعي	
	Material Covered
Week 1-2	The rate of change of function Coordinates
Week 3-4	Increments Equation and slop of straight line
Week 5-6	Functions and graphs Ways of combining functions
Week 7-8	Prepering\Exam
Week 9-10	Derivative of a functions, velocity and acceleration Limits The continuity
Week 11-12	Infinity functions Derivative of algebraic functions, polynomial, rational and inverse functions Composite functions and their derivative, Chain rule Roll's theorem
Week 13-15	Prepering\Exam

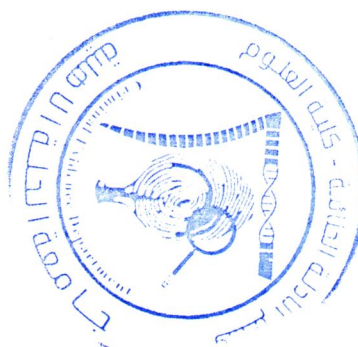
Learning and Teaching Resources	
مصادر التعلم والتدريس	
	Available in the
Text	



		Library?
<b>Required Texts</b>	STROUD, K.A. AND BOOTH, D.J., 2020, Engineering Mathematics, 8th ed, Red Globe Press.	Yes
<b>Recommended Texts</b>	SINGH, K., 2011, Engineering Mathematics Through Applications, 2nd ed, Palgrave.	No
<b>Websites</b>		

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	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	Legal regulation of the criminal expert		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	FOR009			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	1	Semester of Delivery		2
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	ندى استبرق فاضل الزير		e-mail	Nada.est@hilla-unc.edu.iq
Module Leader's Acad. Title	MSC		Module Leader's Qualification	.
Module Tutor	ندى استبرق فاضل الزير		e-mail	Nada.est@hilla-unc.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail	
Scientific Committee Approval Date	1/3/2026	Version Number	1.0	

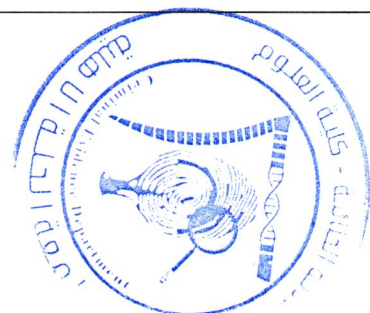
Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	



Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
<b>Module Aims</b> أهداف المادة الدراسية	تزويد الطالب بالمعلومات القانونية المتعلقة بعمله الفني بيان النصوص القانونية التي تنظم عمل خبير الادلة الجنائية تبصير الطالب بالمسؤولية الجزائية والمدنية والانضباطية التي تترتب على مخالفته للقانون
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	اعداد خبير جنائي قادر على فهم وتطبيق القانون بالشكل السليم اعداد ملاكات متكلمة من الناحية القانونية والفنية
<b>Indicative Contents</b> المحتويات الإرشادية	

Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
<b>Strategies</b>	اتباع الاساليب القانونية المقارنة مع التشريعات العراقية وذلك من خلال التطبيقات العملية والمناقشات فضلا عن العصف الذهني

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 أسبوعيا	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 أسبوعيا	6.5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	200		



## Module Evaluation

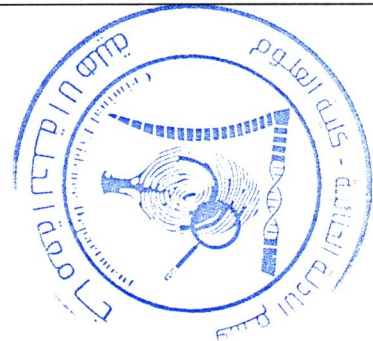
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
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. Report	1	10% (10)	Continuous	
		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	التعريف بالخبير
Week 2	خصائص الخبرة الجنائية
Week 3	شروط الخبير الجنائي
Week 4	العلاقة بين الخبير والشهادة
Week 5	الطبيعة القانونية لعمل الخبير الجنائي
Week 6	المسؤولية القانونية للخبير الجنائي
Week 7	المسؤولية المدنية للخبير
Week 8	المسؤولية الانضباطية
Week 9	علاقة الخبرة بالبحث والتحقيق
Week 10	كيفية انتداب الخبرة
Week 11	الحماية القانونية للخبير
Week 12	القيمة القانونية للخبرة
Week 13	الامتحان الفصلي
Week 14	تطبيقات عملية للخبير في مجال المهارات المعرفية للخبير الجنائي
Week 15	تطبيقات عملية للخبير في مجال المهارات المعرفية للخبير الجنائي
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	

## Learning and Teaching Resources

مصادر التعلم والتدريس

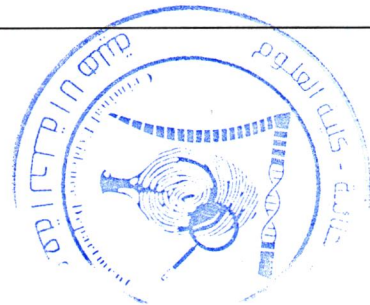
	Text	Available in the Library?
Required Texts		
Recommended Texts		
Websites		

## 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
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	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.

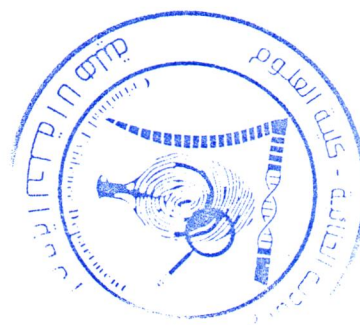


# MODULE DESCRIPTION FORM

## نموذج وصف مادة اللغة العربية

Module Information			
معلومات المادة الدراسية			
Module Title	اللغة العربية		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 type="checkbox"/> Seminar
Module Code	MPH12011		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	1	Semester of Delivery	
Administering Department	MPH	College	SCI
Module Leader	م.د. عياد حمزه شهيد لطيف	e-mail	Gan162gna@gmail.com
Module Leader's Acad. Title	lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	None	e-mail	none
Scientific Committee Approval Date	1/3/2026	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

<p><b>Module Aims</b></p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> <li>1- تعلم العربية السليمة كونها اللغة الرسمية للوطن</li> <li>2- اللغة جوهر الهوية ورمزها</li> <li>3- اللغة تختلف عن اللهجة، فالأولى عالمية والثانية محلية</li> <li>4- توظيف المفردات الفصيحة في الصياغة الأكاديمية للبحوث العلمية مترجمة بنظيرها الفصح</li> <li>5- التمكن من كتابة البحوث والمقالات ذات المحتوى العلمي الصرف باللغة العربية الفصحى</li> <li>6- تجنب الأخطاء الشائعة في الكتابة واختيار المفردات الصائبة</li> <li>7- إثراء الخزين المعجمي لدى الطالب للمساعدة في بناء كاريزما التواصل الكلامي</li> <li>8- الاطلاع على نماذج من الأدب العربي شعرا ونثرا لما لها من أساس في بناء الجانب الثقافي المتنوع لدى الطالب</li> <li>9- كتابة الأعداد بتمكن فضلا الكتابة الصحيحة في صياغة الطلبات الرسمية</li> <li>10- التعرف على الدرس الصوتي في اللغة العربية وعلاقته بعلم الفيزياء</li> </ol>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>عند انتهاء مفردات المادة الدراسية يكون الطالب متمكنا من:</p> <ol style="list-style-type: none"> <li>1- الكتابة السليمة خالية من الأخطاء</li> <li>2- التعبير العلمي الأكاديمي الصحيح</li> <li>3- استعمال المفردات الفصيحة توظيفا ونطقا</li> <li>4- اضافة رصيد لغوي ومفاهيم جديدة لمعاني الكلمات</li> <li>5- القدرة على المخاطبة الإدارية في الطلبات الرسمية</li> </ol>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<ol style="list-style-type: none"> <li>1- لكل تخصص لغته التي ترمي اليه، وتدل عليه، ولغة كل علم تنبع من طبيعة كنهه، فالأختصاصات العلمية لها معجم خاص بها يعبر عن جوهرها ومضمونها، فضلا عن المصطلحات الخاصة بها التي تدل عليها، وكذلك المصادر العلمية التي يُرجع إليها، والحال كما في اللغة الأدبية؛ فهي أيضا لها مفرداتها وطريقة كتابتها والتعبير بها وعبرها، ومصطلحاتها الخاصة بها التي تعبر عنها وتدل عليها. [4 hrs]</li> <li>2- المعاجم - بشكل عام - على اختلاف موارها تمثل محتوى وكفا لمفردات اي لغة مقترنة بالشرح والتفسير لتلك المفردات، اما المعاجم في اللغة العربية فهي واسعة ومتنوعة؛ فهناك معاجم غير معجمات اللغة، فالعربية فيها اول معجم جغرافي في التاريخ، معجم البلدان ل- (ياقوت الحموي)، فضلا عن المعاجم المتخصصة في جزئية معينة، مثل معجم البلاغة، فضلا عن تنوع المدارس في تأليف المعاجم وتبويبها وطريقة البحث عن المفردة فيها. [4 hrs]</li> <li>3- العلامة تدرج ضمن حقل علم السيمياء او السيميائية، وعلامات الترقيم من المواضيع المهمة بالأخص في البحوث الأكاديمية، بغض النظر عن التخصص، سواء كان التخصص علميا، او انسانيا، من هنا تأتي اهمية علامات الترقيم؛ فلها دور سيميائي، ودلالي مهم في الكتابة النصية وفي بناء النص، فهي تُسهّل الفهم على القارئ، وتوضح المعنى المقصود، عبر القراءة والتلفظ بالعبارة، فعلامات الترقيم خير وسيلة لإظهار الصراحة وبيان الوضوح في الكلام المكتوب؛ لأنه يدل الناظر إلى تلك العلامات الاصطلاحية وعلى العلاقات التي تربط أجزاء الكلام بعضها ببعض بوجه عام، وأجزاء كل جملة بوجه خاص، وكما يقول المتخصصون عن علامات الترقيم: بأن الوقف ليس مستقلاً، وإنما هو من توابع التفكير، أي: إن السكتات المقررة بمقادير مضبوطة في مواضع معينة، ليست مجرد محطات تنفسية بالمعنى البيولوجي للتنفس، وإنما في المقام الأول وقات معنوية. فالعبارة من الناحية اللغوية ليست بأن يستعيد القارئ نفسه، بل المهم أن يتعاطى القارئ السكت بمقادير معلومة، وفي مواضع محددة من السلسلة المنطوقة رفعا للبس، وصوناً لمقصد المتكلم عن التبديل، فهذه العلامات تجسيد لمشاعر الكاتب وقصدياته فيها [6 hrs]</li> <li>4- الاسلوب الكتابي يمثل بضمه للكاتب الذي يصدر عنه، ويتجسد عند القارئ، ولكل كاتب اسلوبه الخاص به،</li> </ol>

ينعكس ذلك في نتاج الكاتب، وللأسلوب أنواع مختلفة، فهناك الأسلوب العلمي، والأسلوب الأدبي، والأسلوب الخطابي، ولكل نوع خصائصه، وقالبه الذي يتكون فيه. [4 hrs]

5- الأحداث التي تقتزن بالزمن تمثل الأفعال، والأفعال في العربية تناظر الأزمنة في اللغات الأخرى من جانب معين، أو من جزئية معينة، والعربية تحتوي على عدد كبير من الجذور، جنور الأفعال، ففي العربية أفعال ثلاثية ورباعية وخماسية وسداسية، والفعل جزء مهم من اجزاء الكلام الأساسية، فضلا عن الجانب الصوتي في هذه الجذور، فعلم (الأصوات الفيزيائي) من العلوم المهمة في اللغة العربية، إذ يُعد علم (الأصوات الأكوستيكي) علما أقرب إلى الفيزياء منه للعلوم الإنسانية، وهو يمثل المرحلة الوسطى بين علم الأصوات النطقي وعلم الأصوات السمعي، وعلاقته مع اللغة العربية انطلاقا من البذرة الأولى في دراسة مخارج الحروف فيزيائيا وداليا. [4 hrs]

6- الكلام عن الشعر لا ينتهي؛ فالشعر تجسيد لمشاعر الفرد المتمثل بالشاعر، والمشاعر الجمعية للإنسانية جمعاء، فهو موجود لدى كل بني البشر، والشعر العربي القديم كان بمثابة نشيدا وطنيا لهم، يمثل هويتهم الثقافية الرصينة ويمثل سجلا لتاريخهم وأجدادهم، على اختلاف اغراضه من غزل ومدح وثناء وغير ذلك، وبحور الشعر في الشعر العربي مبنية بناء صوتيا فريدا عبر التفعيلات التي وضعها الخليل بن أحمد الفراهيدي ووضع فلسفتها وكنهها وقواعدها، والشعر رصيد ثقافي، وحجة في الكلام، وزينة ورونقا يضاف على شخصية الفرد والمجتمع بشكل عام. [4 hrs]

7- الهزمة من المواضيع الاجرائية لدى الفرد الكاتب، بغض النظر عن التخصص، فيحتاجها كل فرد ناطق كاتب بها، فلها قواعدها التي تصدر عنها، وتُكتب بالشكل السليم منها، فموضوع رسم الهزمة من الاهمية بمكان؛ فرسمها يغير من المعنى، فلا بد من وضعها ورسمها بالشكل الصحيح لتوخي التعبير الدقيق عن المعنى المقصود. [4 hrs]

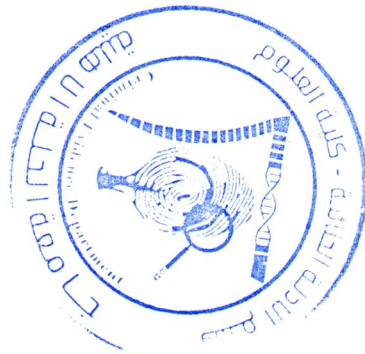
8- المفاعيل في اللغة العربية، من الموضوعات المهمة في درس اللغة العربية، ولا بد لكل دارس من معرفتها بشكل عام، وهناك آراء مختلفة بين البلاغيين والنحويين عن المفاعيل، هل ان تلك المفعولات فضلة، أم أنها ركن رئيس في الجملة؛ فالنحويون يرون انها فضلة في الجملة، وأن ركني الجملة الأساسيين هما: الفعل، والفاعل، وأما البلاغيون فيرون: إنها ليست فضلة، وإنما هي ركن أساسي في الجملة؛ لأن كل كلمة تُدَل على معنى في الجملة، وإذا ما دلت على معنى فلا تُعد فضلة، وإنما هي ركن رئيس في الجملة وبنائها، ورأي البلاغيين أقرب للصواب من رأي النحويين، فدراستها في العربية لغير المختصين مما يضيف لهم خزينا تعبيريا متنوعا. [4 hrs]

9- من المعروف وجود ظاهرة الأخطاء اللغوية نحوية كانت أو املانية أو اسلوبية، عند متحدثي اللغة العربية وبالأخص عند غير المختصين بها ولا سيما من يعملون في مجال الاعلام، وهذه الظاهرة اتسعت وزاد انتشارها في العصر الحديث، فأخذت هذه الأخطاء تغزو مجالات الدراسة جميعها، من ذلك موضوع (العدد) في اللغة العربية، فنجد كثيراً من الطلبة وكذلك من عامة الناس يستعملون الأرقام بدلاً من كتابتها بالحروف؛ وذلك لتجنب الوقوع في الخطأ وهذا دليل ضعف لا يليق بالدارس أياً كان تخصصه؛ ولهذا فموضوع العدد وقواعد كتابته في اللغة العربية موضوع لا غنى عنه في زمن لغة الأرقام. [4 hrs]

10- هناك مجموعة من الالفاظ متداولة بشكل كبير، تُستعمل في غير مكانها الصحيح، وفي غير ما وضعت له وهذه الالفاظ تُستعمل في المخاطبات الرسمية الادارية بالمعنى غير الصحيح او الدقيق الذي تحمله تلك الالفاظ من معاني، فضلا عن أهمية توخي الدقة في هذه الالفاظ توظيفا لها في الطلبات الرسمية التي تُقدم على اختلاف موضوعاتها، فالطلب لا بد من ان يكون مختصرا مركزا، يعطي الفكرة الموجزة، والهدف المقصود منه ازاء صاحب الادارة الذي تُقدم اليه الطلبات، وما في ذلك من ايجابيات العمل في التخفيف واختصار للجهد والوقت في تنفيذ المهام الادارية الموكلة الافراد على اختلاف درجاتهم. [4 hrs]

## Indicative Contents

### المحتويات الإرشادية



## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

**Strategies** صناعة شخصية متكاملة للطلاب الجامعي من حيث التخصص العلمي الدقيق والتخصص المساند

## Student Workload (SWL)

### الحمل الدراسي للطلاب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطلاب خلال الفصل	33	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطلاب أسبوعيا	2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطلاب خلال الفصل	42	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطلاب أسبوعيا	2.8
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطلاب خلال الفصل	75		

## Module Evaluation

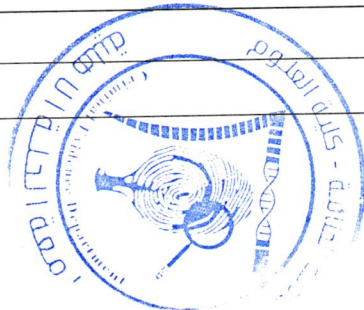
### تقييم المادة الدراسية

		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>	1 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 الاسبوعي النظري

	Material Covered
<b>Week 1</b>	الفرق بين اللغة العلمية واللغة الادبية
<b>Week 2</b>	المعاجم العربية وانواعها
<b>Week 3</b>	علامات الترقيم
<b>Week 4</b>	الاسلوب
<b>Week 5</b>	الأفعال - أنواعها وتقسيماتها
<b>Week 6</b>	نماذج مختارة من الشعر العربي القديم - الشعر الاسلامي - الشعر الاموي
<b>Week 7</b>	Mid-term Exam
<b>Week 8</b>	رسم الهمزة / همزة الوصل وهمزة القطع



Week 9	كتابة الهمزة بداية الكلام وآخره
Week 10	المبتدأ والخبر – مهارات كتابة العدد
Week 11	المفاعيل / المفعول به – المفعول لأجله
Week 12	المفعول معه – المفعول فيه – المفعول المطلق
Week 13	النثر العربي
Week 14	الأخطاء الشائعة – طريقة كتابة الطلبات الرسمية
Week 15	نماذج مختارة من الشعر العباسي والشعر الحديث
Week 16	Preparatory week before the final Exam

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

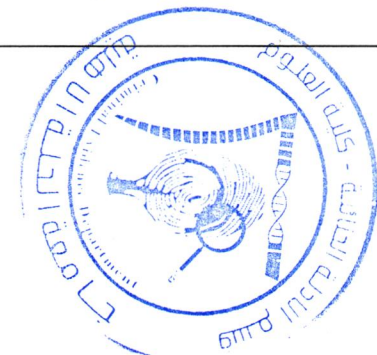
	Texts	Available in the Library?
Required Texts	كتاب: العربية الجامعية لغير المتخصصين / د. عبده الراجحي كتاب: النحو التطبيقي / د. عبده الراجحي	كلا
Recommended Texts	الصرف التطبيقي / د. عبده الراجحي النحو الوافي / عباس حسن تاريخ الادب العربي / شوقي ضيف	كلا
Websites	شبكة الفصيح لعلوم اللغة العربية	

### Grading Scheme

#### مخطط الدرجات

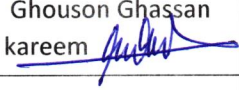
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A – Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	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 Biology 2		Module Delivery
Module Type	Core		<input checked="" 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	FOR1217		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	1	Semester of Delivery	
Administering Department	FOR	College	Science
Module Leader	Ghouson Ghassan kareem	e-mail	Ghusun_ghassan@hilla-unc.edu.iq
Module Leader's Acad. Title	Assistant lecturer	Module Leader's Qualification	MSC
Module Tutor	Ghouson Ghassan kareem	e-mail	E-mail
Peer Reviewer Name	Ghouson Ghassan kareem 	e-mail	Ghusun_ghassan@hilla-unc.edu.iq
Scientific Committee Approval Date	14/012/2025	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

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"><li>1. This module gives students an understanding of the science and techniques that underpin basic biology.</li><li>2. Topics covered will include identification of</li><li>3. Material covered in lectures will be illustrated through lab work.</li><li>4. Highlight in most theories that was deal with biology system for live.</li><li>5. Our aim is to provide students with opportunities to develop academically, professionally and personally: to broaden their ambitions, extend their attitudes, challenge their assumptions, and assist towards unlocking their potential to succeed in their studies and future lives.</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Explain the life and Human , laboratory and legal requirements of producing DNA profiles.</li><li>2. Summarize what is meant by a basic biology science.</li><li>3. Perform interpretation of DNA profiling results, including calculation of likelihood ratios.</li><li>4. Critically evaluate DNA profiling results citing significant research in the field.</li><li>5. Show an understanding of the scientific basis and utilisation of techniques of bone anthropometry and pathology in the study of human tissue.</li><li>6. Identify the tissues and organs in the human body</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Part A - primary information of biology science</u></p> <p>On completion of this module, students are expected to be able to:</p> <ol style="list-style-type: none"><li>1 Demonstrate knowledge of the basic Cell Reproduction , Genetics , Biotechnology, Tissue &amp; Organs in the Human Body , Immunity and Disease</li><li>2 Demonstrate knowledge of the structure and function of the four principal tissue types.</li><li>3 Demonstrate an understanding of Mendelian genetic inheritance. [15 hrs]</li><li>4 Demonstrate understanding of the role of variation in Ecology. [15 hrs]</li><li>5 Evolution of the Genetics , Biotechnology. [16 h]</li><li>6 Demonstrate an understanding type of Tissue &amp; Organs in the Human Body</li><li>7 Demonstrate an understanding Immunity and Disease. [15 hrs]</li></ol> <p><u>Part B - essential and details</u></p> <p>Fundamentals</p> <p>To publicise the key learning resources that are important or essential for those</p>



	<p>studying the module or to demonstrate the academic foundation of the module. To provide a short list, indicating the type and level of information that students are expected to consult. Further, in depth, guidance and a comprehensive list of reading and resources should be made available . [15 hrs]</p> <p>Normally a short list of books or articles in reference format (author, date, title, and publisher). If a core text or textbook exists, this should be indicated. Lists should be indicative, rather than a full bibliography.. [7 hrs]</p> <p>To identify where the whole module may be taken by students at a distance, either by arrangement with the Programme Director or because it forms part of a programme that is wholly or partly delivered virtually. If distance learning is possible, a second module descriptor will need to be created, to identify learning, teaching, assessment and contact methods/support for students in the distance learning version of the module.. [15 hrs]</p>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<p>To describe the learning activities of the students and the teaching methods of the staff. Effective module design should result in a varied range of active learning experiences for students, including learning activities which are ‘research-like’. Activities should, of course, motivate and encourage deep learning (reflection on wider meanings, rather than superficial memorisation of information). They should also be varied and flexible enough to accommodate different learning styles and orientations, and allow for inclusivity of students from different backgrounds and with different kinds of learning abilities.</p> <p>Learning activities therefore need to include reference to independent, interdependent (peer- supported) and online activities, as well as participation in different kinds of taught class.</p>

<b>Student Workload (SWL)</b> الحمل الدراسي للطلاب			
<b>Structured SWL (h/sem)</b>	86	<b>Structured SWL (h/w)</b>	7



الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	89	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	175		

### 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 Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Cell Reproduction
<b>Week 2</b>	Introduction to Genetics
<b>Week 3</b>	Chromosomes and Human Genetics
<b>Week 4</b>	DNA , Genes and Biotechnology
<b>Week 5</b>	Principles of Ecology
<b>Week 6</b>	Exam Mid-term Exam
<b>Week 7</b>	Tissue , Part 1
<b>Week 8</b>	Tissue , Part 2
<b>Week 9</b>	Organs and Organs System
<b>Week 10</b>	Circulation – Heart and Blood Vessels and Blood
<b>Week 11</b>	Respiration , Digestion System , Urinary System
<b>Week 12</b>	Muscular , Skeleton System



<b>Week 13</b>	Nervous System , Sensory System
<b>Week 14</b>	Immunity and Disease
<b>Week 15</b>	EXAM
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

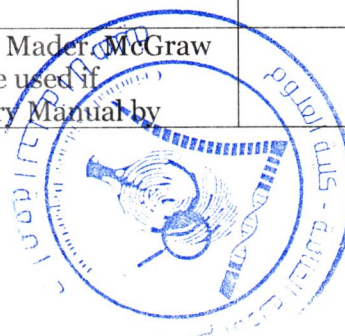
المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	Lab 1: Identify the Cell Reproduction
<b>Week 2</b>	Lab 2: Identify the Genetics
<b>Week 3</b>	Lab 3: Identify the Chromosomes and Human Genetics
<b>Week 4</b>	Lab 4: Identify the DNA , Genes and Biotechnology
<b>Week 5</b>	Lab 5: Identify the Principles of Ecology
<b>Week 6</b>	Lab 6: EXAM
<b>Week 7</b>	Lab 7: Microscopic observation of Tissues part 1
<b>Week 8</b>	Lab 8 : Microscopic observation of Tissues part 2
<b>Week 9</b>	Lab 9 : Identify the Organs and Organs System and understand their functions
<b>Week 10</b>	Lab 10: Identify the Circulation – Heart and Blood Vessels and Blood and type of Blood and understand their functions
<b>Week 11</b>	Lab 11: Identify the Respiration , Digestion System , Urinary System and understand their functions
<b>Week 12</b>	Lab 12: Identify the Muscular , Skeleton System and understand their functions
<b>Week 13</b>	Lab 13: Identify the Nervous System , Sensory System and understand their functions
<b>Week 14</b>	Lab 14: Identify type of Disease relationship with immunity
<b>Week 15</b>	Exam

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	FReece J, Urry L, Cain M, Wasserman S, Minorsky P, Jackson, R. (Eds) 9th Global Edition, 2011, Campbell Biology, Pearson Benjamin Cummings.	Yes
<b>Recommended Texts</b>	Human Biology, 12th edition by Sylvia Mader, McGraw Hill Publishing Co., 2008. (10th can be used if necessary) Human Biology, Laboratory Manual by	No



	Sylvia Mader, 12 <sup>th</sup> edition, McGraw Hill, 2008. Optional Texts: Anatomy & Physiology Coloring Workbook & Study Guide, 9 <sup>th</sup> edition by Elaine Marieb	
<b>Websites</b>	<a href="https://www.aqa.org.uk/subjects/science/as-and-a-level/biology-7401-7402/subject-content">https://www.aqa.org.uk/subjects/science/as-and-a-level/biology-7401-7402/subject-content</a>	

<b>Grading Scheme</b> مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group</b> (50 - 100)	<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</b> (0 - 49)	<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.



# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Organic Chemistry		Module Delivery
Module Type	Core		<input checked="" 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	FOR1228		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	1	Semester of Delivery	
Administering Department	FORN	College	SC
Module Leader	Aqeel Alaa Hussein	e-mail	aqeelalaa@science.uoqasim.edu.iq
Module Leader's Acad. Title	Asst. 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	01/09/2023	Version Number	1.0

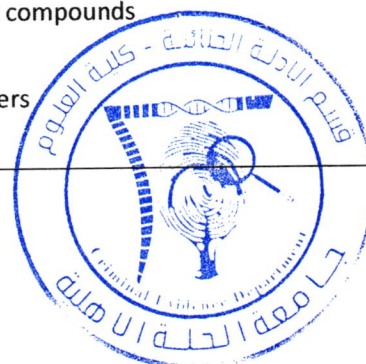
Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	General Chemistry	Semester	1
Co-requisites module	None	Semester	



## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

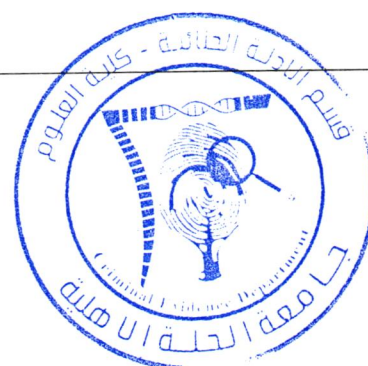
<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>1. On completion of this module students should be able to:</p> <ol style="list-style-type: none"><li>1.Understand the structures of organic molecules and recognize and name examples of them.</li><li>2.Predict the properties and reactions of a molecule from its structure.</li><li>3.Discuss the reactions of common organic compounds.</li><li>4.Design the synthesis of a simple molecule from available starting materials.</li><li>5.Understand the molecular basis of life.</li><li>6.Safely perform a simple chemical synthesis in the laboratory.</li></ol> <p>2. 7.Understand the structures of organic molecules and recognize and name examples of them.</p> <ol style="list-style-type: none"><li>8.Predict the properties and reactions of a molecule from its structure.</li><li>9.Discuss the reactions of common organic compounds.</li><li>10.Safely perform a simple chemical synthesis in the laboratory.</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<p>On successfully completing the module you will be able to...</p> <ol style="list-style-type: none"><li>1. Evaluate and choose appropriate reducing or oxidising agents for selective functional group transformations</li><li>2. Design protecting group strategies to enable chemoselective transformations to be carried out</li><li>3. Perform retrosynthetic analysis on complex organic molecules</li><li>4. Devise multi-step syntheses of complex organic molecules</li><li>5. Discuss the mechanisms of important organic transformations</li><li>6. Explain how synthetic procedures can be modified to allow the simultaneous generation of a wide range of structurally related compounds and address environmental issues</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Module content: First part;[43h]</p> <ul style="list-style-type: none"><li>• identify and draw organic compounds</li><li>• provide the IUPAC name for some organic compounds</li><li>• classify alcohols</li><li>• explain the properties of alcohols and ethers</li></ul>



	<p>Second part:[43]</p> <ul style="list-style-type: none"> <li>• Some organic chemistry fundamentals, basic concepts and terminology</li> <li>• Naming and classification of organic compounds</li> <li>• Basic reactions of alcohols, ethers and carbohydrates</li> <li>• Natural polysaccharides: modification and utilization in various applications</li> <li>• Group work (including presentation and evaluation of the other group works)</li> </ul>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<p>This module builds upon the entry-level knowledge of students covered in A-Level Chemistry. It introduces basic chemical concepts within the context of Organic Chemistry, and starts to develop the more specialist knowledge of organic reactions required for later modules. The latter will be further developed in the Organic Chemistry 2 module.</p> <p>The module will include:</p> <ol style="list-style-type: none"> <li>1. General concepts in organic chemistry for predicting atom and electronic structure of molecules, stability, reactivity and molecular properties (bond strength, pH etc.)</li> <li>2. General concepts and mechanisms underlying organic reactions and ability to draw the mechanism for a given reaction or to give reagents required for an organic reaction.</li> </ol>

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	86	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	6.1
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	89	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	6.3
<b>Total SWL (h/sem)</b> 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
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	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	An Introduction to Organic Chemistry
Week 2	Nomenclature of hydrocarbon
Week 3	Nomenclature of hydrocarbon and stereochemistry
Week 4	Hydrocarbons
Week 5	Unsaturated Hydrocarbons
Week 6	Exam
Week 7	Aromatic Hydrocarbons
Week 8	Organic Halogen Compound
Week 9	Alcohols and Phenols
Week 10	Ethers, Aldehydes and ketones
Week 11	Cyclic compound
Week 12	Carboxyl acid, Esters and Sulfonic acid
Week 13	Nitro compounds, Amines and Amides
Week 14	Exam
Week 15	Review Week
Week 16	Preparatory week before the final Exam



Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Material Safety Data Sheet (MSDS)
Week 2	Lab 2: Determination of melting points
Week 3	Lab 3: Determination of boiling points
Week 4	Lab 4: Recrystallization
Week 5	Lab 5: Density of Some Organic Compounds
Week 6	Lab 6: exam
Week 7	Lab 7: Identification tests of Alkanes, Alkenes, Alkynes and Aromatic
Week 8	Lab 8: Identification tests of primary, secondary and ternary alcohol
Week 9	Lab 9: Identification tests of Ketones and Aldehydes
Week 10	Lab 10: Identification tests of flash point
Week 11	Lab 11: exam theoretical
Week 12	Lab 12: exam practical
Week 13	Application by identification organic compound
Week 14	Application by identification organic compound
Week 15	Reiew before final exam

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	J. Clayden, N. Greeves and S. Warren, Organic Chemistry (Second Edition), Oxford University Press, 2012, ISBN 0-19-927029-5 (essential core text)	Yes
Recommended Texts	C. Willis and M. Wills, Organic Synthesis, (Oxford Chemistry Primer 31), Oxford University Press, 1995, ISBN 0-19-855791-4	No
Websites	ELE page: <a href="https://vle.exeter.ac.uk/course/view.php?id=9255">https://vle.exeter.ac.uk/course/view.php?id=9255</a>	

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