





# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Programming I		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	CS101			
ECTS Credits	8			
SWL (hr/sem)	200			
Module Level		Semester of Delivery		1
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	Dr. Shatha Falih		e-mail	Shatha.falih@gmail.com
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	01/06/2023		Version Number	1.0

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

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>Here are some module aims typically associated with a Programming I course. These aims describe the overarching goals and objectives of the course:</p> <ol style="list-style-type: none"><li>1. This course covers fundamentals of algorithms and give the students an opportunity to write the algorithms.</li><li>2. In this course the students can easily know how to draw flowcharts to describe the algorithms.</li><li>3. The programming aims to learn how to solve problem.</li><li>4. This course covers programming concepts and write codes.</li><li>5. Also after this course the students will know how to control structures and function</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<p>Here are some module learning outcomes that are typically associated with a Programming I course. These outcomes represent the knowledge, skills, and competencies that students are expected to achieve upon completing the course:</p> <ol style="list-style-type: none"><li>1. Develop algorithms to solve "computer-solvable" problems.</li><li>2. Test algorithms.</li><li>3. Translate algorithms to C++ programs.</li><li>4. Debug, run and test C++ "procedural" programs</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Here are some indicative contents for a programming I course targeted at beginners. These contents cover the fundamental concepts and topics typically included in such a course:</p> <ul style="list-style-type: none"><li>• Problem solving</li><li>• Algorithms</li><li>• What is programming?</li><li>• Basic elements of C++</li><li>• General Form of a C++ Program<ul style="list-style-type: none"><li>• Comments</li><li>• Reserved Words</li><li>• Identifiers</li><li>• Variables and constant</li><li>• Data Types</li><li>• Arithmetic Operators and Operator Precedence</li><li>• Expressions</li></ul></li><li>• Assignment Statement</li><li>• Declaring and Initializing Variables</li><li>• Input and output</li><li>• Control Structures<ul style="list-style-type: none"><li>• Relational Operators and precedence</li><li>• Selection<ul style="list-style-type: none"><li>• Selection: if and if...else</li><li>• Compound (Block of) Statements</li><li>• Multiple Selections: Nested if</li><li>• Selection: Switch case</li></ul></li></ul></li></ul>

	<ul style="list-style-type: none"> <li>• Repetition <ul style="list-style-type: none"> <li>• for Looping Structure</li> </ul> </li> <li>• User-defined functions</li> <li>• Function declarations and call</li> <li>• Scope rule of an Identifier</li> </ul>
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## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	When teaching a programming I course to beginners, it's important to adopt strategies that cater to their foundational understanding and gradually build their knowledge and skills. Here are some effective learning and teaching strategies for beginners in a Programming I course:
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## Student Workload (SWL)

### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	45	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	80	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5, 10	LO #1, 2, 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>	2 hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الأسبوعي النظري

	Material Covered
<b>Week 1</b>	Problem solving Algorithms What is programming?
<b>Week 2</b>	Basic elements of C++ General Form of a C++ Program Comments
<b>Week 3</b>	Reserved Words Identifiers Variables and constant Data Types
<b>Week 4</b>	Arithmetic Operators and Operator Precedence Expressions
<b>Week 5</b>	Assignment Statement Declaring and Initializing Variables
<b>Week 6</b>	Input and output
<b>Week 7</b>	Control Structures Relational Operators and precedence
<b>Week 8</b>	Selection Selection: if and if...else
<b>Week 9</b>	Compound (Block of) Statements
<b>Week 10</b>	Multiple Selections: Nested if
<b>Week 11</b>	Selection: Switch case
<b>Week 12</b>	Repetition for Looping Structure
<b>Week 13</b>	User-defined functions Function declarations and call
<b>Week 14</b>	User-defined functions Function declarations and call
<b>Week 15</b>	General Discussion
<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: Basic elements of C++
<b>Week 2</b>	Lab 2: Variables and constant
<b>Week 3</b>	Lab 3: Expressions
<b>Week 4</b>	Lab 4: Declaring and Initializing Variables
<b>Week 5</b>	Lab 5: : if and if...else
<b>Week 6</b>	Lab 6: Switch case
<b>Week 7</b>	Lab 7: for Looping

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	<ol style="list-style-type: none"> <li>1. Problem solving with c++ by Walter Savitch, 7th edition, 2009.</li> <li>2. C++: The Complete Reference by Herbert Schildt, 4<sup>th</sup> edition, 2003</li> </ol>	
<b>Recommended Texts</b>	A first book of c++ by Gary Bronson, 4 <sup>th</sup> edition, 2012 by Gary Bronson	
<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
	<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

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**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	Computational Thinking for Problem Solving		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	CS102		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Name	e-mail	E-mail
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	01/06/2023	Version Number	1.0

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

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. Develop computational thinking skills.</li><li>2. Enhance problem-solving abilities.</li><li>3. Foster logical and analytical thinking.</li><li>4. Promote algorithmic reasoning and design.</li><li>5. Cultivate creativity and innovation in problem solving.</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Apply computational thinking techniques to analyze and solve problems.</li><li>2. Utilize algorithms and logical reasoning to develop efficient solutions.</li><li>3. Demonstrate proficiency in problem decomposition and pattern recognition.</li><li>4. Employ abstraction and generalization to model and solve complex problems.</li><li>5. Cultivate critical thinking and creativity in problem-solving approaches.</li><li>6. Communicate and collaborate effectively in problem-solving scenarios.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <ol style="list-style-type: none"><li>1. Basics Introduction: number systems, data encoding.</li><li>2. Problem Solving: Problem definition, decomposition, abstraction.</li><li>3. Algorithmic Thinking: Flowcharting, selection, repetition.</li><li>4. Data organization: Lists, arrays, modularization.</li><li>5. Problem Solving Techniques: Factoring, recursion.</li></ol>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<ol style="list-style-type: none"><li>1. Engage students through interactive lectures and discussions.</li><li>2. Utilize hands-on coding exercises and projects to apply computational thinking concepts.</li><li>3. Provide real-world examples and case studies to demonstrate the practical application of problem-solving techniques.</li><li>4. Foster collaborative learning through group activities and problem-solving challenges.</li><li>5. Offer opportunities for self-paced learning and practice through online resources and coding platforms.</li><li>6. Provide timely feedback and guidance to support students' progress and improvement in problem-solving skills.</li></ol>
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	47	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	3.1
<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 أسبوعياً	5.2
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	3, 8, 13	LO # 1, 2, 3, and 5
	Assignments	3	10% (10)	6, 10, 15	All
	Projects	1	5% (5)	15	
Summative assessment	Exam	2hr	25% (25)	11	All
	Final Exam	2hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	Material Covered
<b>Weeks 1</b>	Pillars of Computational Thinking
<b>Weeks 2-3</b>	Basics Introduction: Information and data, data types, data encoding, Boolean algebra, simplification of Boolean expression.
<b>Weeks 4-6</b>	Problem Solving: Problem definition, Problem decomposition, Abstraction, Greedy Method, Divide and Conquer.
<b>Week 7-8</b>	Algorithm and Flowcharting, Name binding.
<b>Week 9-10</b>	Selection
<b>Week 11</b>	Exam I
<b>Week 12-13</b>	Repetition
<b>Week 14-15</b>	Data organization: Arrays, Modularization, Problem Solving: Factoring and Recursion Techniques.

Week 16	Preparatory week before the final Exam
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Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	David Riley and Kenny Hunt , Computational thinking for modern solver, Chapman & Hall/CRC, 2014	No
Recommended Texts	R.G. Dromey , “How to solve it by Computer”, PHI, 2008	No
Websites	code.org	

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	<b>Mathematics for computer science</b>		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lectures	
Module Code				
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	1	Semester of Delivery		1
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	Naser Oda Jassim		e-mail	Nasir.jasim@uobasrah.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.	
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0	

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

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Objectives</b></p> <p>أهداف المادة الدراسية</p>	<p>-Cognitive Goals</p> <ol style="list-style-type: none"> <li>1. Upon Successful completion of this subject, students should :</li> <li>2. Be able to use algebra accurately;</li> <li>3. Be able to plot and interpret graphs</li> <li>4. Be able to use exponential, logarithm, and trigonometric functions in applications;</li> <li>5. Be able to calculate the sums of arithmetic and geometric series and use them in simple financial calculations;</li> <li>6. Be able to use basic rules of differentiation and calculate derivatives of simple functions;</li> <li>7. Be able to use matrix in solving linear system of equations;</li> </ol> <p>-Skill goals</p> <ol style="list-style-type: none"> <li>1. Enable the student to refer the mathematical problem to a program and find a solution through the computer.</li> <li>2. Student realization of the close relationship between mathematical problems and computer programs</li> </ol>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks.</p> <ol style="list-style-type: none"> <li>1. This subject is designed for students who enter university without a strong background in mathematics</li> <li>2. It is also for students who are planning to enroll in subjects requiring basic numeracy skills such as sciences, computing and information technology.</li> <li>3. The subject reinforces calculation skills, basic algebra .</li> <li>4. This subject is designed to work with formula.</li> <li>5. It is also to use applications of exponential and logarithmic functions.</li> <li>6. It is designed how applying matric to solve linear system of equations.</li> </ol>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Part A – Sequences and series</p> <p><u>Sequence</u> is a function whose domain is the set of natural numbers. The terms of the sequence are the function values. There will be studied two types of</p>

sequences: arithmetic and geometric sequences with their partial sums. While series means that the infinite sum of geometric sequence. [12 hrs]

#### Part B – Matrices

Matrices are simply a rectangular array of numbers with **m** rows and **n** columns . There will be studied some: types of matrices, algebra of matrices. It is also studied how to find inverse of matrix, how to use matrix and its inverse to solve linear system of equations, how to find determinant of matrix and use it to solve linear system of equations. [12 hrs]

#### Part C – Derivatives and integrals

Derivatives mean that if  $f: x \rightarrow y$  is a function, the derivative of a function  $f$  at a point  $x_0$  written  $f'(x_0)$ ; is given by

$f'(x_0) = \lim_{x \rightarrow x_0} \frac{f(x) - f(x_0)}{x - x_0}$ , If this limit exists and finite. There will be studied the derivatives of usual functions, implicit derivatives, derivatives of trigonometric functions, derivatives of exponential and logarithm functions. Graphical of exponential and logarithm functions. While integrals means that if  $f(x)$  function defined at some interval, let  $F(x)$  be another function such that  $F'(x) = f(x)$ ,  $F(x)$  called an infinite integral of  $f(x)$  and is written as the following form  $\int f(x)dx = F(x) + C$ . [12 hrs].

#### Part D – Interest

Interest is the rental fee charged by a lender to a business or an individual for the use of money . There will be studied simple and compound interests. Simple interest means that the interest is calculated *only once* for the entire time period of the loan. At the end of the time period, the borrower repays the principal plus the Interest . while compound interest means that means that the interest is calculated more than once during the time period of the loan. [9 hrs].

### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

#### Strategies

1.Explain the topic in detail by the teacher by writing the topic and explaining it on the board and other teaching aids

	2. Discussion during the lecture period 3. Doing homework 4. See the websites of the subject
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<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
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>200</b>		

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

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Introduction - Sequences
<b>Week 2</b>	Arithmetic sequences and their partial sums
<b>Week 3</b>	Geometric sequences and their partial sums
<b>Week 4</b>	Series
<b>Week 5</b>	Matrices and algebra of matrices
<b>Week 6</b>	Inverse of matrices
<b>Week 7</b>	Solving linear system of equations by using inverse of matrices
<b>Week 8</b>	Determinant and using it to solve linear system of equations
<b>Week 9</b>	Derivatives
<b>Week 10</b>	Derivatives of trigonometric, exponential, logarithm functions
<b>Week 11</b>	Integrals
<b>Week 12</b>	Integral of trigonometric, exponential, logarithm functions
<b>Week 13</b>	Interest and simple interest
<b>Week 14</b>	Compound interest
<b>Week 15</b>	Present and future values of an annuity
<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>	

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	Cheryl Cleaves, Margie Hobbs and Jeffrey Noble	Yes
Recommended Texts	James Stewart , Lothar Redlin and Saleem Watson Robert Brechner and George Bergeman	yes
Websites		

### 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	<b>Computer Skills</b>		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 type="checkbox"/> Seminar
Module Code	<b>CSIT0102</b>		
ECTS Credits	7		
SWL (hr/sem)			
Module Level	1	Semester of Delivery	1
Administering Department	CIS	College	CSIT
Module Leader	Ebtisam.s.jaber	e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MSc.
Module Tutor	Name (if available)	e-mail	ebtesam.jaber@uobasrah.edu.iq
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	

<b>Co-requisites module</b>	Principles of information technology	<b>Semester</b>	2
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### Module Aims, Learning Outcomes and Indicative Contents

#### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Objectives</b></p> <p>أهداف المادة الدراسية</p>	<p>This course aims at teaching students how to use a variety of computer applications as tools to improve students' performance in school, increase their future productivity in the work place and enhance their level of critical thinking. Students will use computer networks and applications to locate, evaluate, and use information, create written documents and oral presentations. This course will assist students in understanding the underlying concepts of these technologies and provide project-oriented learning opportunities. The goal is for students to become independent users of information, computer technology and library resources.</p>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>The student will acquire fundamental computer skills that can be effectively applied to data processing and presentation tasks. This includes gaining proficiency in essential computer operations, such as file management, utilizing productivity tools, and navigating digital interfaces. Through practical application, the student will develop the ability to handle and manipulate data, as well as create compelling presentations.</p>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<ol style="list-style-type: none"> <li>1. Introduction to the computer <ul style="list-style-type: none"> <li>- Basic components of a computer (monitor, CPU, storage, etc.)</li> <li>- Keyboard vs. mouse</li> <li>- Desktop vs. laptop</li> <li>- Activity: power off/on computers</li> </ul> </li> <li>2. Introduction to Windows <ul style="list-style-type: none"> <li>- Desktop (icons, Start button, taskbar)</li> <li>- Cursor/mouse</li> <li>- Activity: click &amp; drag desktop icons</li> <li>- Programs (3 ways to start programs: icon, Start, All Programs)</li> </ul> </li> <li>3. Typing</li> </ol>

#### 4. Windows Navigation

- Window features (minimize, resize, exit, click & drag)
- Menu bar (drop-down arrow)
- Tool bar (icons) (roll cursor over to ID)
- Scrolling
- Multiple ways to do the same thing (menu, icon, keyboard)

#### 5. Word

- How to open Word (icon, Start menu, All Programs)
- What is a "document"
- Using the cursor with text (how to position, different types of cursor)
- Review menu bar and tool bar
- Using the keyboard with text (arrows, backspace, delete, tab, shift, space, enter keys)
- Highlighting text (click & drag, full line from margin, edit/select all)
- Requirement to highlight text for formatting commands
- Formatting commands (Bold/Italicize/Underline, show as "on/off" icons)
- Font size, Font type (review drop-down arrow)
- Text color, Text highlight (review drop-down arrow)
- Alignment (left, center, right)
- Undo/Redo
- Spell check (by the word, by the document)
- Find/replace
- Bullets/numbers
- Review Windows Navigation (lesson 6)
- Copy/cut/paste

#### 6. Excel

- Introduction to Excel (cells, row, column)
- Tables
- Basic Excel formulas

#### 7. Windows File Management

	<ul style="list-style-type: none"> <li>- Options for storage (internal drive, flash drive, CD/DVD)</li> <li>- Introduce Flash Drive</li> <li>- Files and Folders</li> <li>- My Computer</li> <li>- Save As, Save and Exit without changes</li> </ul> <p>8. Internet Navigation</p> <ul style="list-style-type: none"> <li>- What is the Internet</li> <li>- What is a Web Browser</li> <li>- Links and navigation bars</li> <li>- Back &amp; forward arrow buttons, home button</li> <li>- Address bar (how to use the website address/URL in the address bar)</li> </ul> <p>9. Internet Search</p> <ul style="list-style-type: none"> <li>- How to start a web browser (Mozilla Firefox or Internet Explorer)</li> <li>- Getting to Google (toolbars, search box, other Google features)</li> <li>- Job search</li> </ul> <p>10. EMAIL</p> <ul style="list-style-type: none"> <li>- Open new email</li> <li>- Send emails (attachment, text...)</li> </ul>
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<p><b>Learning and Teaching Strategies</b></p> <p>استراتيجيات التعلم والتعليم</p>	
<b>Strategies</b>	<p>The primary approach for delivering this module will focus on fostering active student engagement in exercises, while simultaneously enhancing their critical thinking abilities. This will be accomplished through a combination of classroom and laboratory sessions, interactive tutorials, and the incorporation of captivating sampling activities to facilitate hands-on learning experiences for the students.</p>

### Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطلاب خلال الفصل	77	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطلاب أسبوعيا	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطلاب خلال الفصل	98	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطلاب 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 and 10	LO #1, #2 and #10, #11
	<b>Assignments</b>	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	<b>Projects / Lab.</b>	1	10% (10)	Continuous	All
	<b>Report</b>	1	10% (10)	13	LO #5, #8 and #10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2hr	10% (10)	7	LO #1 - #7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

<b>Material Covered</b>
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<b>Week 1</b>	<ul style="list-style-type: none"> <li>✓ Using the Computer and Managing Files</li> <li>• Operating System</li> <li>• File Management</li> <li>• Utilities</li> <li>• Print Management</li> </ul>
<b>Week 2</b>	<ul style="list-style-type: none"> <li>✓ Word Processing</li> <li>• Using the Application</li> <li>• Document Creation</li> <li>• Formatting</li> </ul>
<b>Week 3</b>	<ul style="list-style-type: none"> <li>✓ Word Processing</li> <li>• Objects</li> <li>• Mail Merge</li> <li>• Prepare Outputs</li> </ul>
<b>Week 4</b>	<ul style="list-style-type: none"> <li>✓ Word Processing</li> <li>• Referencing</li> <li>• Enhancing Productivity</li> <li>• Collaborative Editing</li> </ul>
<b>Week 5</b>	<ul style="list-style-type: none"> <li>✓ Spreadsheets</li> <li>• Using the Application</li> <li>• Cells</li> <li>• Managing Worksheets</li> <li>• Formulas and Functions</li> </ul>
<b>Week 6</b>	<ul style="list-style-type: none"> <li>✓ Spreadsheets</li> <li>• Formatting</li> <li>• Charts</li> <li>• Prepare Outputs</li> <li>• Analysis</li> </ul>
<b>Week 7</b>	<ul style="list-style-type: none"> <li>✓ Spreadsheets</li> <li>• Validating and Auditing</li> <li>• Enhancing Productivity</li> <li>• Collaborative Editing</li> </ul>
<b>Week 8</b>	Mid-term Exam
<b>Week 9</b>	<ul style="list-style-type: none"> <li>✓ Presentation</li> <li>• Using the Application</li> <li>• Developing a Presentation</li> <li>• Text</li> <li>• Charts and Diagrams</li> </ul>
<b>Week 10</b>	<ul style="list-style-type: none"> <li>✓ Presentation</li> <li>• Graphical Objects</li> <li>• Prepare Outputs</li> <li>• Presentation Planning</li> <li>• Slide Masters and Templates</li> </ul>
<b>Week 11</b>	<ul style="list-style-type: none"> <li>✓ Presentation</li> <li>• Multimedia</li> <li>• Enhancing Productivity</li> <li>• Managing Presentations</li> </ul>

<b>Week 12</b>	<ul style="list-style-type: none"> <li>✓ Online Essentials</li> <li>• Web Browsing Concepts</li> <li>• Web Browsing</li> </ul>
<b>Week 13</b>	<ul style="list-style-type: none"> <li>✓ Online Essentials</li> <li>• Web-Based Information</li> <li>• Communication Concepts</li> <li>• Using E-mail</li> </ul>
<b>Week 14</b>	<ul style="list-style-type: none"> <li>✓ Visio</li> <li>• Using the Application</li> <li>• Creating Technical Layouts</li> </ul>
<b>Week 15</b>	<ul style="list-style-type: none"> <li>✓ Visio</li> <li>• Exploring Advanced Diagrams</li> <li>• Diagramming and Data</li> <li>• Advanced Custom Shape Design</li> </ul>

### Delivery Plan (Weekly Lab. Syllabus)

#### المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	<ol style="list-style-type: none"> <li>1. Operating System: <ul style="list-style-type: none"> <li>• Familiarization with the chosen operating system</li> <li>• Navigating through the desktop, taskbar, and start menu</li> </ul> </li> <li>2. File Management: <ul style="list-style-type: none"> <li>• Creating, renaming, copying, moving, and deleting files and folders</li> <li>• Sorting and organizing files based on different criteria</li> </ul> </li> <li>3. Utilities: <ul style="list-style-type: none"> <li>• Exploring system utilities for maintenance tasks</li> <li>• Performing basic optimization tasks for computer performance</li> </ul> </li> <li>4. Print Management: <ul style="list-style-type: none"> <li>• Setting up and configuring printers</li> <li>• Printing documents and adjusting print settings</li> </ul> </li> </ol>
<b>Week 2</b>	<ol style="list-style-type: none"> <li>1. Using the Application: <ul style="list-style-type: none"> <li>• Opening the word processing application</li> <li>• Exploring the user interface and menus</li> </ul> </li> <li>2. Document Creation: <ul style="list-style-type: none"> <li>• Creating and saving a new document</li> <li>• Opening an existing document</li> </ul> </li> <li>3. Formatting: <ul style="list-style-type: none"> <li>• Applying font styles, sizes, and colors</li> <li>• Adjusting paragraph alignment</li> <li>• Adding bullet points or numbering</li> <li>• Applying basic text formatting (bold, italic, underline)</li> </ul> </li> </ol>
<b>Week 3</b>	<ol style="list-style-type: none"> <li>1. Objects: <ul style="list-style-type: none"> <li>• Inserting and formatting images and shapes</li> <li>• Adjusting object size and position</li> <li>• Applying borders and shading</li> </ul> </li> <li>2. Mail Merge: <ul style="list-style-type: none"> <li>• Creating a data source with recipient information</li> <li>• Designing a template with placeholders</li> </ul> </li> </ol>

	<ul style="list-style-type: none"> <li>• Performing a mail merge to generate personalized documents</li> <li>• Previewing and editing merged documents</li> </ul> <p>3. Prepare Outputs:</p> <ul style="list-style-type: none"> <li>• Formatting documents for printing</li> <li>• Setting up headers, footers, and page numbers</li> <li>• Adding tables of contents or indexes</li> <li>• Creating PDF or electronic document formats</li> </ul>
<b>Week 4</b>	<p>1. Referencing:</p> <ul style="list-style-type: none"> <li>• Adding citations and creating a bibliography</li> <li>• Inserting footnotes or endnotes</li> </ul> <p>2. Enhancing Productivity:</p> <ul style="list-style-type: none"> <li>• Using shortcuts and keyboard commands for faster editing</li> <li>• Customizing the user interface and toolbar</li> </ul> <p>3. Collaborative Editing:</p> <ul style="list-style-type: none"> <li>• Enabling track changes and reviewing document revisions</li> <li>• Inserting comments and resolving conflicts</li> </ul>
<b>Week 5</b>	<p>1. Using the Application:</p> <ul style="list-style-type: none"> <li>• Navigating the spreadsheet application</li> <li>• Exploring different toolbars and options</li> </ul> <p>2. Cells:</p> <ul style="list-style-type: none"> <li>• Entering and formatting data in cells</li> <li>• Adjusting cell alignment and text wrapping</li> </ul> <p>3. Managing Worksheets:</p> <ul style="list-style-type: none"> <li>• Creating, renaming, and deleting worksheets</li> <li>• Moving and copying worksheets</li> </ul> <p>4. Formulas and Functions:</p> <ul style="list-style-type: none"> <li>• Writing basic formulas for calculations</li> <li>• Using common functions (e.g., sum, average, count)</li> <li>• Referencing cells in formulas</li> </ul>
<b>Week 6</b>	<p>1. Formatting:</p> <ul style="list-style-type: none"> <li>• Formatting cell content</li> <li>• Applying conditional formatting</li> </ul> <p>2. Charts:</p> <ul style="list-style-type: none"> <li>• Creating charts</li> <li>• Customizing chart elements</li> </ul> <p>3. Prepare Outputs:</p> <ul style="list-style-type: none"> <li>• Setting up print areas</li> <li>• Saving and sharing spreadsheets</li> </ul> <p>4. Analysis:</p> <ul style="list-style-type: none"> <li>• Using functions for data analysis</li> <li>• Sorting and filtering data</li> </ul>
<b>Week 7</b>	<p>1. Validating and Auditing:</p> <ul style="list-style-type: none"> <li>• Setting data validation rules</li> <li>• Auditing formulas for errors</li> </ul> <p>2. Enhancing Productivity:</p> <ul style="list-style-type: none"> <li>• Using shortcuts for efficient navigation</li> <li>• Utilizing autofill and templates</li> </ul> <p>3. Collaborative Editing:</p> <ul style="list-style-type: none"> <li>• Tracking changes by multiple users</li> <li>• Inserting comments</li> </ul>
<b>Week8</b>	Lab Exam
<b>Week9</b>	<p>1. Using the Application:</p> <ul style="list-style-type: none"> <li>• Navigating the presentation application</li> <li>• Exploring different toolbars and options</li> </ul> <p>2. Developing a Presentation:</p>

	<ul style="list-style-type: none"> <li>• Creating slides and selecting layouts</li> <li>• Adding and arranging content (text, images, shapes)</li> <li>• Applying themes and customizing backgrounds</li> </ul> <p>3. Text:</p> <ul style="list-style-type: none"> <li>• Formatting text (font, size, color)</li> <li>• Aligning and spacing text on slides</li> </ul> <p>4. Charts:</p> <ul style="list-style-type: none"> <li>• Inserting and formatting charts</li> <li>• Adding labels and titles to charts</li> </ul>
<b>Week10</b>	<p>1. Graphical Objects:</p> <ul style="list-style-type: none"> <li>• Inserting and manipulating graphical objects</li> <li>• Applying effects and styles to graphics</li> <li>• Arranging and aligning graphical objects on slides</li> </ul> <p>2. Prepare Outputs:</p> <ul style="list-style-type: none"> <li>• Setting up slide layouts and design elements</li> <li>• Configuring slide transitions and animations</li> </ul> <p>3. Presentation Planning:</p> <ul style="list-style-type: none"> <li>• Outlining the structure and content of the presentation</li> <li>• Determining key messages and visuals for each slide</li> </ul> <p>4. Slide Masters and Templates:</p> <ul style="list-style-type: none"> <li>• Modifying slide masters for consistent design</li> <li>• Creating and applying slide templates</li> </ul>
<b>Week11</b>	<p>1. Multimedia:</p> <ul style="list-style-type: none"> <li>• Inserting and managing multimedia elements (videos, audio, animations)</li> <li>• Configuring playback settings for multimedia</li> <li>• Syncing multimedia with slide transitions</li> </ul> <p>2. Enhancing Productivity:</p> <ul style="list-style-type: none"> <li>• Utilizing shortcuts and productivity features</li> <li>• Using slide layouts and templates</li> <li>• Applying design themes for visual appeal</li> </ul> <p>3. Managing Presentations:</p> <ul style="list-style-type: none"> <li>• Organizing and managing slides</li> <li>• Rearranging slide order</li> <li>• Configuring slide show settings</li> </ul>
<b>Week12</b>	<p>1. Web Browsing Concepts:</p> <ul style="list-style-type: none"> <li>• Understanding the basics of web browsing</li> <li>• Exploring different web browsers and their features</li> <li>• Learning about search engines and their functionalities</li> </ul> <p>2. Web Browsing:</p> <ul style="list-style-type: none"> <li>• Opening a web browser and navigating to websites</li> <li>• Using bookmarks and favourites to save and access web pages</li> <li>• Exploring tabs and managing multiple web pages</li> </ul>
<b>Week13</b>	<p>1. Web-Based Information:</p> <ul style="list-style-type: none"> <li>• Searching and accessing information from websites</li> <li>• Evaluating online source reliability</li> <li>• Bookmarking useful websites</li> </ul> <p>2. Communication Concepts:</p> <ul style="list-style-type: none"> <li>• Understanding online communication forms</li> <li>• Practicing netiquette and online etiquette</li> <li>• Recognizing online communication risks</li> </ul> <p>3. Using E-mail:</p> <ul style="list-style-type: none"> <li>• Composing and sending emails</li> <li>• Managing email folders</li> <li>• Attaching files and formatting emails</li> </ul>
<b>Week14</b>	<p>1. Using the Application:</p> <ul style="list-style-type: none"> <li>• Opening and navigating the Visio application</li> </ul>

	<ul style="list-style-type: none"> <li>Exploring the user interface and toolbars</li> <li>Familiarizing with various Visio features and options</li> </ul> <p>2. Creating Technical Layouts:</p> <ul style="list-style-type: none"> <li>Creating and arranging shapes on a drawing canvas</li> <li>Adding connectors and lines to create flowcharts or diagrams</li> </ul> <p>Applying formatting and styles to enhance the visual appearance</p>
<b>Week15</b>	<p>1. Exploring Advanced Diagrams:</p> <ul style="list-style-type: none"> <li>Creating complex diagrams with advanced shapes and connectors</li> <li>Using templates and stencils for specific diagram types</li> <li>Incorporating advanced features like layers and callouts</li> </ul> <p>2. Diagramming and Data:</p> <ul style="list-style-type: none"> <li>Importing and linking external data to create data-driven diagrams</li> <li>Customizing data visuals and applying data graphics</li> <li>Creating organizational charts or network diagrams with data connectivity</li> </ul> <p>3. Advanced Custom Shape Design:</p> <ul style="list-style-type: none"> <li>Creating and modifying custom shapes using shape creation tools</li> <li>Enhancing existing shapes to meet specific requirements</li> <li>Utilizing shape behaviours and metadata for enhanced functionality</li> </ul>

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	<b>Microsoft Office 2013 Visual Quickstart Guide</b> by Steve Schwartz	
<b>Recommended Texts</b>	Gary B. Shelly, Misty E. Vermaat (2010). Microsoft Office 2010: Brief. Cengage Learning. OR any ECDL, ICDL or IC3 books	
<b>Websites</b>	<a href="https://www.microsoft.com">https://www.microsoft.com</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</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded

<b>(0 – 49)</b>	<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	Programming II		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	CS106			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	2	Semester of Delivery		1
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	Dr. Shatha Falih		e-mail	Shatha.falih@gmail.com
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	01/06/2023	Version Number	1.0	

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

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b></p> <p>أهداف المادة الدراسية</p>	<p>Here are some module aims typically associated with a Programming I course. These aims describe the overarching goals and objectives of the course:</p> <ol style="list-style-type: none"> <li>6. This course covers basic concepts and techniques for programming including : repetition statements (while and for).</li> <li>7. In this course the students can learn how to deal with arrays.</li> <li>8. The programming II aims to learn how to understand the strings.</li> </ol>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>At the end of this course, students should be able to design, write and test c++ program to implement a working solution to a given problem.</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<p><b>Strategies</b></p>	<p>When teaching a programming I course to beginners, it's important to adopt strategies that cater to their foundational understanding and gradually build their knowledge and skills. Here are some effective learning and teaching strategies for beginners in a Programming I course:</p>
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## Student Workload (SWL)

### الحمل الدراسي للطالب

<p><b>Structured SWL (h/sem)</b></p> <p>الحمل الدراسي المنتظم للطالب خلال الفصل</p>	<p>45</p>	<p><b>Structured SWL (h/w)</b></p> <p>الحمل الدراسي المنتظم للطالب أسبوعيا</p>	
<p><b>Unstructured SWL (h/sem)</b></p> <p>الحمل الدراسي غير المنتظم للطالب خلال الفصل</p>	<p>80</p>	<p><b>Unstructured SWL (h/w)</b></p> <p>الحمل الدراسي غير المنتظم للطالب أسبوعيا</p>	
<p><b>Total SWL (h/sem)</b></p> <p>الحمل الدراسي الكلي للطالب خلال الفصل</p>	<p>125</p>		

## Module Evaluation

### تقييم المادة الدراسية

	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<p>Quizzes</p>	<p>2</p>	<p>10% (10)</p>	<p>5, 10</p>	<p>LO #1, 2, 10 and 11</p>

Formative assessment	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	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

#### المنهاج الأسبوعي النظري

	Material Covered
<b>Week 1</b>	Repetition while Looping Structure
<b>Week 2</b>	do..while Looping Structure
<b>Week 3</b>	Nested Control Structures
<b>Week 4</b>	Nested Control Structures
<b>Week 5</b>	Arrays One and two dimensional array: Declaration Access
<b>Week 6</b>	Array as parameter
<b>Week 7</b>	Strings Declaration String functions
<b>Week 8</b>	Array of string
<b>Week 9</b>	Array of string
<b>Week 10</b>	Structures Compare the structure with the arrays
<b>Week 11</b>	Access field of structure
<b>Week 12</b>	Fields Assigning values
<b>Week 13</b>	Structures initialization
<b>Week 14</b>	Functions and structures
<b>Week 15</b>	General Discussion
<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: while Looping
<b>Week 2</b>	Lab 2 do..while Looping
<b>Week 3</b>	Lab 3: Nested Control
<b>Week 4</b>	Lab 4: Arrays
<b>Week 5</b>	Lab 5: : Strings
<b>Week 6</b>	Lab 6: Array of string
<b>Week 7</b>	Lab 7: Functions and structures

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	3. Problem solving with c++ by Walter Savitch, 7th edition,2009. 4. C++: The Complete Reference by Herbert Schildt, 4 <sup>th</sup> edition, 2003	
<b>Recommended Texts</b>	A first book of c++ by Gary Bronson, 4 <sup>th</sup> edition, 2012 by Gary Bronson	
<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
	<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	<b>Discrete Structures</b>		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 checked="" type="checkbox"/> Seminar
Module Code			
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Name	e-mail	E-mail
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	01/06/2023	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents
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## 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. We can develop our mathematical ability</li> <li>2. Discrete mathematic is the gateway to more advanced courses in all part of math.</li> <li>3. Discrete mathematics provides the math foundations for many computer science courses</li> <li>4. Discrete mathematics contains the necessary math back ground for solving problems in operation research, chemistry, and engineering.</li> </ol>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>6. formulate solutions for selected mathematical problem</li> <li>7. Apply objective mathematical reasoning to systems composed of discrete objects.</li> <li>8. Assess mathematical proofs.</li> <li>9. Interpret situations that have a predetermined sequence of actions that depend on a limited sequence of events.</li> <li>10. categorize all possible outcomes for a series of events, or all possible collections of a set of objects;</li> <li>11. diagram hierarchical relationships between individual entities within a given situation using relations; and</li> <li>12. Diagram hierarchical relationships between individual entities within a given situation using function.</li> <li>13. apply Trees of mathematical or system entities as tools in computer science to solve various real-world problems; and</li> <li>14. Apply Graph of mathematical or system entities as tools in computer science to solve various real-world problems.</li> </ol>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Sets, Types of set, Operations on sets, Set identities, Computer Representation of Sets (multi-sets, fuzzy sets), Sequences and Summations. [12 hrs]</p> <p>Properties of Integers and Applications of Number Theory, Propositional and Logical Operations, Conditional Statements. [6 hrs]</p> <p>Mathematical reasoning and Induction, Recursive, Mathematical proofs: Methods of Proving Theorems. [12 hrs]</p> <p>Properties of Relations, Operations Relations, Computer Representation of Relations, Functions, Properties of Functions, Functions types. [12 hrs]</p> <p>Trees, Types of trees, Trees as Models, Properties of Trees, Tree Traversal, Universal Address Systems , Traversal Algorithms, Infix, Prefix, and Postfix Notation of tree. [15 hrs]</p> <p>Graph, Types of graphs, Some Special Simple Graphs, Representing Graphs, Isomorphism and Isomorphic of graphs. [12 hrs]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<ol style="list-style-type: none"> <li>1. Convergent and divergent thinking.</li> <li>2. Project-based learning.</li> <li>3. Experiential learning.</li> <li>4. Peer teaching.</li> <li>5. Inquiry-based learning.</li> <li>6. Problem-based learning.</li> <li>7. Reciprocal teaching.</li> </ol>
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## Student Workload (SWL)

### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	45	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	3
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	80	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	5.5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	3	15% (15)	2, 5, 10	LO #1, 2, 8 and 9
	<b>Assignments</b>	3	15% (15)	3,6, 12	LO # 3, 4, 6 and 7
	<b>Projects / Lab.</b>				
	<b>Report</b>	1	10% (10)	13	LO # 5, 7 and 9
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-8
	<b>Final Exam</b>	2hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الأسبوعي النظري

<b>Material Covered</b>
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<b>Week 1</b>	Sets, Types of set, Operations on sets
<b>Week 2</b>	Set identities, Computer Representation of Sets (multi-sets, fuzzy sets)
<b>Week 3</b>	Sequences and Summations
<b>Week 4</b>	Properties of Integers and Applications of Number Theory
<b>Week 5</b>	Propositional and Logical Operations, Conditional Statements
<b>Week 6</b>	Mathematical reasoning and Induction, Recursive
<b>Week 7</b>	Mathematical proofs: Methods of Proving Theorems
<b>Week 8</b>	Mid-term Exam
<b>Week 9</b>	Relations: Properties of Relations, Operations Relations, Computer Representation of Relations
<b>Week 10</b>	Functions: Properties of Functions, Functions types
<b>Week 11</b>	Trees: Types of trees, Trees as Models, Properties of Trees
<b>Week 12</b>	Tree Traversal, Universal Address Systems , Traversal Algorithms
<b>Week 13</b>	Infix, Prefix, and Postfix Notation of tree
<b>Week 14</b>	Graph: Types of graphs, Some Special Simple Graphs
<b>Week 15</b>	Representing Graphs, Isomorphism and Isomorphic of graphs
<b>Week 16</b>	Preparatory week before the final Exam

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Essential Discrete Mathematics for Computer Science, by Harry Lewis and Rachel Zax, Princeton University Press , ASIN: B07H5384J5, 2019.	No
<b>Recommended Texts</b>	Discrete Structures, Logic, and Computability by James L. Hein, Jones & Bartlett Learning; 4 edition, 2015.	No
<b>Websites</b>	<a href="https://www.cs.cornell.edu">https://www.cs.cornell.edu</a>	

### Grading Scheme

مخطط الدرجات

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

<b>(50 - 100)</b>	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
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	<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	<b>Principles of IT</b>		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 type="checkbox"/> Seminar	
Module Code				
ECTS Credits	7			
SWL (hr/sem)				
Module Level	1	Semester of Delivery		2
Administering Department	CIS	College	CSIT	
Module Leader	Ebtisam.s.jaber		e-mail	ebtesam.jaber@uobasrah.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MSc.	
Module Tutor	Name (if available)		e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date	01/06/2023	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	2

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Objectives</b> أهداف المادة الدراسية	This course aims at teaching students how to use a variety of computer applications as tools to improve students' performance in school, increase their future productivity in the work place and enhance their level of critical thinking. Students will use computer networks and applications to locate, evaluate, and use information, create written documents and oral presentations. This course will assist students in understanding the underlying concepts of these technologies and provide project-oriented learning opportunities. The goal is for students to become independent users of information, computer technology and library resources.
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	The student will acquire fundamental computer skills that can be effectively applied to data processing and presentation tasks. This includes gaining proficiency in essential computer operations, such as file management, utilizing productivity tools, and navigating digital interfaces. Through practical application, the student will develop the ability to handle and manipulate data, as well as create compelling presentations.
<b>Indicative Contents</b> المحتويات الإرشادية	<p>The course will build on your existing user-level knowledge and experience with personal computer software and hardware to present fundamental skills and concepts that you will use on the job.</p> <p>In this course, you will acquire the essential skills and information you will need to install, upgrade, repair, configure, troubleshoot, optimize, and perform preventative maintenance of basic personal computer hardware and operating systems</p> <p>This course will:</p> <p>Help acquires the essential skills and information needed to install, upgrade, repair, configure, troubleshoot, optimize, and perform preventative maintenance of basic personal computer hardware and operating systems.</p> <p>Assist you in preparing to take the CompTIA A+ certification Examinations</p>

Identify network technologies.

Install and manage network connections.

Support laptops and portable computing devices.

Support printers and scanners.

Identify personal computer security concepts.

Support personal computer security

1- In this session, you will learn to:

2- Identify the major components of personal computers.

3- Identify the major components of the system unit.

4- Identify the various types of storage devices used in personal computers.

6- Identify personal computer connection methods

2- In this session, you will learn to:

Identify the major personal computer operating systems.

Identify the primary components of the Windows user interface.

Identify the primary tools and functions used in Windows file system management.

Identify Windows system management tools.

3- In this session, you will learn to:

Identify common hardware and software tools used by professional personal computer technicians.

Identify the best practices for PC technicians to follow to promote electrical safety.

Identify the best practices for PC technicians to follow to promote environmental safety and proper handling of materials.

Identify and apply the general preventative maintenance best

practices that PC technicians should employ.

Identify the general diagnostics and troubleshooting best practices that PC technicians should employ.

Identify best practices for PC technicians to use to communicate appropriately with clients and colleagues and conduct business in a professional manner

3- In this session, you will learn to:

Identify common hardware and software tools used by professional personal computer technicians.

Identify the best practices for PC technicians to follow to promote electrical safety.

Identify the best practices for PC technicians to follow to promote environmental safety and proper handling of materials.

Identify and apply the general preventative maintenance best practices that PC technicians should employ.

Identify the general diagnostics and troubleshooting best practices that PC technicians should employ.

Identify best practices for PC technicians to use to communicate appropriately with clients and colleagues and conduct business in a professional manner

4- In this session, you will learn to:

Install and configure display devices.

Install and configure input devices.

Install and configure adapter cards.

Install multimedia devices

5- In this session, you will learn to:

Select, install, and configure storage devices.

Install and configure power supplies.

Install and configure memory.

Install and configure CPUs.

Install and configure system boards.

6-In this session, you will learn to:

Test and troubleshoot display devices.

Maintain and troubleshoot input devices.

Test and troubleshoot adapter cards.

Troubleshoot multimedia devices.

Troubleshoot storage devices

7-In this session, you will learn to:

Test and troubleshoot power supplies.

Test and troubleshoot memory.

Test and troubleshoot CPUs.

Test and troubleshoot system boards

8-In this session, you will learn to:

Install Microsoft Windows.

Upgrade Windows from a given version to a later version.

Add devices to an installation of Microsoft Windows.

Optimize an installation of Microsoft Windows

9-In this session, you will learn to:

Identify Windows operating system utilities to use in maintenance and troubleshooting.

Perform backups.

Troubleshoot Windows.

Recover a damaged installation of Windows

10-In this session, you will learn to:

Identify fundamental concepts of computer networks.

Identify network communications technologies.

Identify network connectivity technologies.

Identify Internet technologies

11-In this session, you will learn to:

Create network connections.

Install and configure web browsers.

Maintain and troubleshoot network connections.

Identify components that are specialized for laptops and portable computing devices.

12-In this session, you will learn to:

Install and configure laptops and portable computing devices.

Maintain and troubleshoot laptops and portable computing devices.

Identify major types of printer and scanner technologies

13-In this session, you will learn to:

Identify the technical components of printers and scanners.

Identify printing and scanning processes.

Install and configure printers and scanners.

Maintain and troubleshoot printers and scanners

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The primary approach for delivering this module will focus on fostering active student engagement in exercises, while simultaneously enhancing their critical thinking abilities. This will be accomplished through a combination of classroom and laboratory sessions, interactive tutorials, and the incorporation of captivating sampling activities to facilitate hands-on learning experiences for the students.
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## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	77	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	4
<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	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 and 10	LO #1, #2 and #10, #11
	<b>Assignments</b>	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	<b>Projects / Lab.</b>	1	10% (10)	Continuous	All

	<b>Report</b>	1	10% (10)	13	LO #5, #8 and #10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2hr	10% (10)	7	LO #1 - #7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	<b>Material Covered</b>
<b>Week 1</b>	<ul style="list-style-type: none"> <li>✓</li> <li>• Identify the major components of personal computers.</li> <li>• Identify the major components of the system unit.</li> <li>• Identify the various types of storage devices used in personal computers.</li> <li>• Identify personal computer connection methods</li> <li>•</li> </ul>
<b>Week 2</b>	<ul style="list-style-type: none"> <li>• Identify the major personal computer operating systems.</li> <li>• Identify the primary components of the Windows user interface.</li> <li>• Identify the primary tools and functions used in Windows file system management.</li> <li>• Identify Windows system management tools.</li> </ul>
<b>Week 3</b>	<ul style="list-style-type: none"> <li>• Identify common hardware and software tools used by professional personal computer technicians.</li> <li>• Identify the best practices for PC technicians to follow to promote electrical safety.</li> <li>• Identify the best practices for PC technicians to follow to promote environmental safety and proper handling of materials.</li> <li>• Identify and apply the general preventative maintenance best practices that PC technicians should employ.</li> <li>• Identify the general diagnostics and troubleshooting best practices that PC technicians should employ.</li> <li>• Identify best practices for PC technicians to use to communicate appropriately with clients and colleagues and conduct business in a professional manner</li> </ul>
<b>Week 4</b>	<ul style="list-style-type: none"> <li>• Install and configure display devices.</li> <li>• Install and configure input devices.</li> <li>• Install and configure adapter cards.</li> </ul>

	<ul style="list-style-type: none"> <li>• Install multimedia devices</li> </ul>
<b>Week 5</b>	<ul style="list-style-type: none"> <li>• Select, install, and configure storage devices.</li> <li>• Install and configure power supplies.</li> <li>• Install and configure memory.</li> <li>• Install and configure CPUs.</li> <li>• Install and configure system boards.</li> </ul>
<b>Week 6</b>	<ul style="list-style-type: none"> <li>• Test and troubleshoot display devices.</li> <li>• Maintain and troubleshoot input devices.</li> <li>• Test and troubleshoot adapter cards.</li> <li>• Troubleshoot multimedia devices.</li> <li>• Troubleshoot storage devices</li> </ul>
<b>Week 7</b>	<ul style="list-style-type: none"> <li>• Test and troubleshoot power supplies.</li> <li>• Test and troubleshoot memory.</li> <li>• Test and troubleshoot CPUs.</li> <li>• Test and troubleshoot system boards</li> </ul>
<b>Week 8</b>	Mid-term Exam
<b>Week 9</b>	<ul style="list-style-type: none"> <li>• Install Microsoft Windows.</li> <li>• Upgrade Windows from a given version to a later version.</li> <li>• Add devices to an installation of Microsoft Windows.</li> <li>• Optimize an installation of Microsoft Windows</li> </ul>
<b>Week 10</b>	<ul style="list-style-type: none"> <li>• Identify Windows operating system utilities to use in maintenance and troubleshooting.</li> <li>• Perform backups.</li> <li>• Troubleshoot Windows.</li> <li>• Recover a damaged installation of Windows</li> </ul>
<b>Week 11</b>	<ul style="list-style-type: none"> <li>• Identify fundamental concepts of computer networks.</li> <li>• Identify network communications technologies.</li> <li>• Identify network connectivity technologies.</li> <li>• Identify Internet technologies</li> </ul>
<b>Week 12</b>	<ul style="list-style-type: none"> <li>• Create network connections.</li> <li>• Install and configure web browsers.</li> <li>• Maintain and troubleshoot network connections.</li> <li>• Identify components that are specialized for laptops and portable computing devices.</li> </ul>
<b>Week 13</b>	<ul style="list-style-type: none"> <li>• Install and configure laptops and portable computing devices.</li> <li>• Maintain and troubleshoot laptops and portable computing devices.</li> <li>• Identify major types of printer and scanner technologies</li> </ul>
<b>Week 14</b>	<ul style="list-style-type: none"> <li>• Install and configure laptops and portable computing devices.</li> <li>• Maintain and troubleshoot laptops and portable computing devices.</li> <li>• Identify major types of printer and scanner technologies</li> </ul>

<b>Week 15</b>	<ul style="list-style-type: none"> <li>• Identify the technical components of printers and scanners.</li> <li>• Identify printing and scanning processes.</li> <li>• Install and configure printers and scanners.</li> <li>• Maintain and troubleshoot printers and scanners</li> </ul>
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<p><b>Delivery Plan (Weekly Lab. Syllabus)</b></p> <p>المنهاج الاسبوعي للمختبر</p>
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	<b>Material Covered</b>
<b>Week 1</b>	<ol style="list-style-type: none"> <li>1. Operating System: <ul style="list-style-type: none"> <li>• Familiarization with the chosen operating system</li> <li>• Navigating through the desktop, taskbar, and start menu</li> </ul> </li> <li>2. File Management: <ul style="list-style-type: none"> <li>• Creating, renaming, copying, moving, and deleting files and folders</li> <li>• Sorting and organizing files based on different criteria</li> </ul> </li> <li>3. Utilities: <ul style="list-style-type: none"> <li>• Exploring system utilities for maintenance tasks</li> <li>• Performing basic optimization tasks for computer performance</li> </ul> </li> <li>4. Print Management: <ul style="list-style-type: none"> <li>• Setting up and configuring printers</li> <li>• Printing documents and adjusting print settings</li> </ul> </li> </ol>
<b>Week 2</b>	<ol style="list-style-type: none"> <li>1. Using the Application: <ul style="list-style-type: none"> <li>• Opening the word processing application</li> <li>• Exploring the user interface and menus</li> </ul> </li> <li>2. Document Creation: <ul style="list-style-type: none"> <li>• Creating and saving a new document</li> <li>• Opening an existing document</li> </ul> </li> <li>3. Formatting: <ul style="list-style-type: none"> <li>• Applying font styles, sizes, and colors</li> <li>• Adjusting paragraph alignment</li> <li>• Adding bullet points or numbering</li> <li>• Applying basic text formatting (bold, italic, underline)</li> </ul> </li> </ol>
<b>Week 3</b>	<ol style="list-style-type: none"> <li>1. Objects: <ul style="list-style-type: none"> <li>• Inserting and formatting images and shapes</li> <li>• Adjusting object size and position</li> <li>• Applying borders and shading</li> </ul> </li> <li>2. Mail Merge: <ul style="list-style-type: none"> <li>• Creating a data source with recipient information</li> <li>• Designing a template with placeholders</li> <li>• Performing a mail merge to generate personalized documents</li> <li>• Previewing and editing merged documents</li> </ul> </li> <li>3. Prepare Outputs: <ul style="list-style-type: none"> <li>• Formatting documents for printing</li> <li>• Setting up headers, footers, and page numbers</li> <li>• Adding tables of contents or indexes</li> <li>• Creating PDF or electronic document formats</li> </ul> </li> </ol>
<b>Week 4</b>	<ol style="list-style-type: none"> <li>1. Referencing: <ul style="list-style-type: none"> <li>• Adding citations and creating a bibliography</li> <li>• Inserting footnotes or endnotes</li> </ul> </li> <li>2. Enhancing Productivity: <ul style="list-style-type: none"> <li>• Using shortcuts and keyboard commands for faster editing</li> <li>• Customizing the user interface and toolbar</li> </ul> </li> </ol>

	<ol style="list-style-type: none"> <li>3. Collaborative Editing: <ul style="list-style-type: none"> <li>• Enabling track changes and reviewing document revisions</li> <li>• Inserting comments and resolving conflicts</li> </ul> </li> </ol>
<b>Week 5</b>	<ol style="list-style-type: none"> <li>1. Using the Application: <ul style="list-style-type: none"> <li>• Navigating the spreadsheet application</li> <li>• Exploring different toolbars and options</li> </ul> </li> <li>2. Cells: <ul style="list-style-type: none"> <li>• Entering and formatting data in cells</li> <li>• Adjusting cell alignment and text wrapping</li> </ul> </li> <li>3. Managing Worksheets: <ul style="list-style-type: none"> <li>• Creating, renaming, and deleting worksheets</li> <li>• Moving and copying worksheets</li> </ul> </li> <li>4. Formulas and Functions: <ul style="list-style-type: none"> <li>• Writing basic formulas for calculations</li> <li>• Using common functions (e.g., sum, average, count)</li> <li>• Referencing cells in formulas</li> </ul> </li> </ol>
<b>Week 6</b>	<ol style="list-style-type: none"> <li>1. Formatting: <ul style="list-style-type: none"> <li>• Formatting cell content</li> <li>• Applying conditional formatting</li> </ul> </li> <li>2. Charts: <ul style="list-style-type: none"> <li>• Creating charts</li> <li>• Customizing chart elements</li> </ul> </li> <li>3. Prepare Outputs: <ul style="list-style-type: none"> <li>• Setting up print areas</li> <li>• Saving and sharing spreadsheets</li> </ul> </li> <li>4. Analysis: <ul style="list-style-type: none"> <li>• Using functions for data analysis</li> <li>• Sorting and filtering data</li> </ul> </li> </ol>
<b>Week 7</b>	<ol style="list-style-type: none"> <li>1. Validating and Auditing: <ul style="list-style-type: none"> <li>• Setting data validation rules</li> <li>• Auditing formulas for errors</li> </ul> </li> <li>2. Enhancing Productivity: <ul style="list-style-type: none"> <li>• Using shortcuts for efficient navigation</li> <li>• Utilizing autofill and templates</li> </ul> </li> <li>3. Collaborative Editing: <ul style="list-style-type: none"> <li>• Tracking changes by multiple users</li> <li>• Inserting comments</li> </ul> </li> </ol>
<b>Week8</b>	Lab Exam
<b>Week9</b>	<ol style="list-style-type: none"> <li>1. Using the Application: <ul style="list-style-type: none"> <li>• Navigating the presentation application</li> <li>• Exploring different toolbars and options</li> </ul> </li> <li>2. Developing a Presentation: <ul style="list-style-type: none"> <li>• Creating slides and selecting layouts</li> <li>• Adding and arranging content (text, images, shapes)</li> <li>• Applying themes and customizing backgrounds</li> </ul> </li> <li>3. Text: <ul style="list-style-type: none"> <li>• Formatting text (font, size, color)</li> <li>• Aligning and spacing text on slides</li> </ul> </li> <li>4. Charts: <ul style="list-style-type: none"> <li>• Inserting and formatting charts</li> <li>• Adding labels and titles to charts</li> </ul> </li> </ol>
<b>Week10</b>	<ol style="list-style-type: none"> <li>1. Graphical Objects: <ul style="list-style-type: none"> <li>• Inserting and manipulating graphical objects</li> <li>• Applying effects and styles to graphics</li> <li>• Arranging and aligning graphical objects on slides</li> </ul> </li> </ol>

	<ol style="list-style-type: none"> <li>2. Prepare Outputs: <ul style="list-style-type: none"> <li>• Setting up slide layouts and design elements</li> <li>• Configuring slide transitions and animations</li> </ul> </li> <li>3. Presentation Planning: <ul style="list-style-type: none"> <li>• Outlining the structure and content of the presentation</li> <li>• Determining key messages and visuals for each slide</li> </ul> </li> <li>4. Slide Masters and Templates: <ul style="list-style-type: none"> <li>• Modifying slide masters for consistent design</li> <li>• Creating and applying slide templates</li> </ul> </li> </ol>
<b>Week11</b>	<ol style="list-style-type: none"> <li>1. Multimedia: <ul style="list-style-type: none"> <li>• Inserting and managing multimedia elements (videos, audio, animations)</li> <li>• Configuring playback settings for multimedia</li> <li>• Syncing multimedia with slide transitions</li> </ul> </li> <li>2. Enhancing Productivity: <ul style="list-style-type: none"> <li>• Utilizing shortcuts and productivity features</li> <li>• Using slide layouts and templates</li> <li>• Applying design themes for visual appeal</li> </ul> </li> <li>3. Managing Presentations: <ul style="list-style-type: none"> <li>• Organizing and managing slides</li> <li>• Rearranging slide order</li> <li>• Configuring slide show settings</li> </ul> </li> </ol>
<b>Week12</b>	<ol style="list-style-type: none"> <li>1. Web Browsing Concepts: <ul style="list-style-type: none"> <li>• Understanding the basics of web browsing</li> <li>• Exploring different web browsers and their features</li> <li>• Learning about search engines and their functionalities</li> </ul> </li> <li>2. Web Browsing: <ul style="list-style-type: none"> <li>• Opening a web browser and navigating to websites</li> <li>• Using bookmarks and favourites to save and access web pages</li> <li>• Exploring tabs and managing multiple web pages</li> </ul> </li> </ol>
<b>Week13</b>	<ol style="list-style-type: none"> <li>1. Web-Based Information: <ul style="list-style-type: none"> <li>• Searching and accessing information from websites</li> <li>• Evaluating online source reliability</li> <li>• Bookmarking useful websites</li> </ul> </li> <li>2. Communication Concepts: <ul style="list-style-type: none"> <li>• Understanding online communication forms</li> <li>• Practicing netiquette and online etiquette</li> <li>• Recognizing online communication risks</li> </ul> </li> <li>3. Using E-mail: <ul style="list-style-type: none"> <li>• Composing and sending emails</li> <li>• Managing email folders</li> <li>• Attaching files and formatting emails</li> </ul> </li> </ol>
<b>Week14</b>	<ol style="list-style-type: none"> <li>1. Using the Application: <ul style="list-style-type: none"> <li>• Opening and navigating the Visio application</li> <li>• Exploring the user interface and toolbars</li> <li>• Familiarizing with various Visio features and options</li> </ul> </li> <li>2. Creating Technical Layouts: <ul style="list-style-type: none"> <li>• Creating and arranging shapes on a drawing canvas</li> <li>• Adding connectors and lines to create flowcharts or diagrams</li> </ul> </li> </ol> <p>Applying formatting and styles to enhance the visual appearance</p>
<b>Week15</b>	<ol style="list-style-type: none"> <li>1. Exploring Advanced Diagrams: <ul style="list-style-type: none"> <li>• Creating complex diagrams with advanced shapes and connectors</li> <li>• Using templates and stencils for specific diagram types</li> <li>• Incorporating advanced features like layers and callouts</li> </ul> </li> <li>2. Diagramming and Data: <ul style="list-style-type: none"> <li>• Importing and linking external data to create data-driven diagrams</li> </ul> </li> </ol>

	<ul style="list-style-type: none"> <li>• Customizing data visuals and applying data graphics</li> <li>• Creating organizational charts or network diagrams with data connectivity</li> </ul> <p>3. Advanced Custom Shape Design:</p> <ul style="list-style-type: none"> <li>• Creating and modifying custom shapes using shape creation tools</li> <li>• Enhancing existing shapes to meet specific requirements</li> <li>• Utilizing shape behaviours and metadata for enhanced functionality</li> </ul>
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## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	<b>CompTIA A+ Certification: A Comprehensive Approach</b> <b>for all 2009 Exam Objectives</b>	
Recommended Texts		
Websites	<a href="https://www.microsoft.com">https://www.microsoft.com</a>	

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> <b>(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</b> <b>(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	<b>Object oriented programming I</b>		Module Delivery
Module Type	Core		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			
ECTS Credits	8		
SWL (hr/sem)			
Module Level	2	Semester of Delivery	
Administering Department	CS	College	It
Module Leader	Name	e-mail	E-mail
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

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

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>THIS COURSE WILL PROVIDE A BASIC UNDERSTANDING OF THE METHODS AND TECHNIQUES OF DEVELOPING A SIMPLE TO MODERATELY COMPLEX WEB SITE. USING THE CURRENT STANDARD WEB PAGE LANGUAGE, STUDENTS WILL BE INSTRUCTED ON CREATING AND MAINTAINING A SIMPLE WEB SITE. AFTER THE FOUNDATION LANGUAGE HAS BEEN ESTABLISHED, THE AID OF AN WEB EDITOR WILL BE INTRODUCED. THIS COURSE WILL PROVIDE A RIGOROUS TREATMENT OF OBJECT - ORIENTED CONCEPTS (DESIGN AND IMPLEMENTATION OF OBJECTS, CLASS CONSTRUCTION AND DESTRUCTION, ENCAPSULATION, INHERITANCE, AND POLYMORPHISM) USING JAVA AS AN EXAMPLE LANGUAGE.</p>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<p>DEVELOPMENT OF SOUND PROGRAMMING AND DESIGN SKILLS, PROBLEM SOLVING AND MODELING OF REAL-WORLD PROBLEMS FROM SCIENCE, ENGINEERING, AND ECONOMICS USING THE OBJECT-ORIENTED PARADIGM.</p>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <ol style="list-style-type: none"> <li>1 <u>Programming style</u></li> <li>2 <u>Basic statements with looping and repetitions</u></li> <li>3 <u>One dimensional Arrays</u></li> <li>4 <u>Two dimensional Arrays</u></li> <li>5 <u>Classes and methods</u></li> <li>6 <u>Constructors, Variable types, Overloading</u></li> <li>7 <u>UML diagrams</u></li> <li>8 <u>Programming by contract: preconditions, postconditions and invariants</u></li> <li>9 <u>Designing interfaces</u></li> <li>10 <u>Polymorphism</u></li> <li>11 <u>Encapsulation</u></li> <li>12 <u>Inheritance</u></li> </ol>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<p><b>Strategies</b></p>	<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,</p>
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	interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	102	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	6.5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	200		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
<b>Summative assessment</b>	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	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>	Programming style
<b>Week 2</b>	Basic statements with looping and repetitions

<b>Week 3</b>	One dimensional Arrays
<b>Week 4</b>	Two dimensional Arrays
<b>Week 5</b>	Classes and methods
<b>Week 6</b>	Classes and methods
<b>Week 7</b>	Constructors, Variable types,
<b>Week 8</b>	, Overloading
<b>Week 9</b>	UML diagrams
<b>Week 10</b>	Programming by contract: preconditions,
<b>Week 11</b>	postconditions and invariants
<b>Week 12</b>	Designing interfaces
<b>Week 13</b>	Polymorphism
<b>Week 14</b>	Encapsulation
<b>Week 15</b>	Inheritance
<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: Programming style,Basic statements with looping and repetitions
<b>Week 2</b>	Lab 2: One dimensional Arrays
<b>Week 3</b>	Lab 3: two dimensional Arrays
<b>Week 4</b>	Lab 4: Classes and methods
<b>Week 5</b>	Lab 5: Constructors, Variable types,, Overloading
<b>Week 6</b>	Lab 6: Programming by contract: preconditions,postconditions and invariants
<b>Week 7</b>	Lab 7: Polymorphism,Encapsulation,Inheritance

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?

<b>Required Texts</b>	C. Thomas Wu (2010). An Introduction to Object-Oriented Programming with Java. Fifth Edition. McGraw-Hill.	Yes
<b>Recommended Texts</b>	2] Herbert Schildt (2007). Java: The Complete Reference. Seventh Edition. McGraw-Hill.	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
	<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	Data Structures and Algorithms I		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 type="checkbox"/> Seminar
Module Code	CS202		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	
Administering Department	CS	College	CSIT
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CS106	Semester	2
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Objectives</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. Understand the importance and types of data structures.</li><li>2. Learn about array representation and operations.</li><li>3. Gain knowledge of string manipulation and algorithms.</li><li>4. Understand the concept and implementation of linked lists.</li><li>5. Learn about stack operations and practical uses.</li><li>6. Comprehend the concept and applications of recursion.</li><li>7. Understand queue operations and their applications.</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Recognize and explain the importance of data structures in programming.</li><li>2. Demonstrate proficiency in array manipulation and accessing elements.</li><li>3. Apply string manipulation techniques and algorithms to solve problems.</li><li>4. Implement and utilize linked lists for efficient data management.</li><li>5. Apply stack operations and utilize stacks in various problem-solving scenarios.</li><li>6. Implement recursive functions and apply recursion to solve problems effectively.</li><li>7. Implement and utilize queues for efficient data handling and problem-solving.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<ul style="list-style-type: none"><li>• Introduction to Data Structures</li><li>• Classification of Data Structures</li><li>• Arrays</li><li>• Strings</li><li>• Linked lists</li><li>• Stacks and Its Application</li><li>• Recursion</li><li>• Queues</li></ul>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<ol style="list-style-type: none"><li>1. Lectures and interactive discussions</li><li>2. Practical laboratory sessions</li><li>3. Problem-solving exercises and tutorials</li><li>4. Simulation tools and software</li><li>5. Assessments (exams, projects) with feedback</li></ol>
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## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	77	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	73	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>150</b>		

## Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	6% (6)	4, 12	LO #1,2 and 5
	<b>Assignments</b>	2	7% (7)	8, 15	LO # 3,4, 6 and 7
	<b>Projects / Lab.</b>	1	17% (17)	Continuous	
<b>Summative assessment</b>	<b>Exam</b>	2 hr	20% (20)	7	LO # 1-4
	<b>Final Lab</b>	2 hr	17% (17)		All
	<b>Final Exam</b>	2hr	33% (33)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Introduction - <b>Types of Data types, type of data structures</b>
<b>Week 2</b>	Arrays DS: definition, features, logic, physical structure, access equations of one dimensional array.
<b>Week 3</b>	Arrays DS: logic, physical structure, access equations of two dimensional arrays.

<b>Week 4</b>	Arrays DS: logic, physical structure, access equation of three and multi-dimensional arrays and triangle arrays.
<b>Week 5</b>	Strings DS: definition, basic representations in memory, create String object
<b>Week 6</b>	Linked Lists DS: definition, advantage and disadvantage of arrays and linked lists, basic operations of linked lists, types of linked lists.
<b>Week 7</b>	<b>Exam</b>
<b>Week 8</b>	Implementation of linked lists
<b>Week 9</b>	Stack DS: definition, features, implementation using linked lists and Arrays
<b>Week 10</b>	Stack DS: Application-recursion
<b>Week 11</b>	Stack DS: Application- Expression Conversion
<b>Week 12</b>	Stack DS: Application- evaluating expressions
<b>Week 13</b>	Queue DS: definition, features, implementation using linked lists
<b>Week 14</b>	Queue DS: definition, features, implementation using Arrays
<b>Week 15</b>	Queue DS: types of queues
<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: Arrays classes in java package
<b>Week 2</b>	Lab 2: tasks in Arrays
<b>Week 3</b>	Lab 3: Strings methods in java package
<b>Week 4</b>	Lab 4: tasks in Strings
<b>Week 5</b>	Lab 4: tasks in Strings ( <b>1<sup>st</sup> Quiz</b> )
<b>Week 6</b>	Lab 5: Linked Lists class in java package

<b>Week 7</b>	Lab 6: tasks in linked lists (single and circular linked lists)
<b>Week 8</b>	Lab7: tasks in linked lists (double and Circular Double Linked Lists)
<b>Week 9</b>	Lab 8: Stack class in java package
<b>Week 10</b>	Lab 9: Stack to evaluate expression
<b>Week 11</b>	Lab 10: Stack class in java package
<b>Week 12</b>	Lab 10: Stack class in java package (2 <sup>nd</sup> Quiz)
<b>Week 13</b>	Lab 11: implement queue using arrays
<b>Week 14</b>	Lab 12: implement queue using linked lists

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Data Structures and Algorithms in Java. Michael T. Goodrich, Roberto Tamassia, and Michael H. Goldwasser. 6th Edition. 2014 John Wiley & Sons, Inc.	No
<b>Recommended Texts</b>	Data Structures and Abstractions with Java™. Frank M. Carrano and Timothy M. Henry. Fifth Edition 2019 Pearson Education, Inc.	No
<b>Websites</b>	<a href="https://www.javatpoint.com/data-structure-tutorial">https://www.javatpoint.com/data-structure-tutorial</a>	

### Grading Scheme

#### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
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	<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>	<b>FX – Fail</b>	راسب (قييد المعالجة)	(45-49)	More work required but credit awarded
<b>(0 – 49)</b>	<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

### System Analysis and Design-CS204

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Systems Analysis and Design</b>		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	CS204		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	
Administering Department	Computer Science	College	College of Information Technology
Module Leader	Baida'a AbdulQader Khudor	e-mail	Bidaa.khudor@uobasrah.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ms.c.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module	Database Systems	Semester	2

### Module Aims, Learning Outcomes and Indicative Contents

## أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<p>The objective of this course is to provide students with the concepts, process, and tools of systems analysis and systems design, learn new technique and approaches to develop systems more effectively and efficiently.</p> <p>The students learn that all information systems projects move through the four phases of planning, analysis, design, and implementations; all projects require analyst to gathering requirements, model the business needs, and create blueprints for how the systems should be built, and all projects require an understanding of organizational behavior concepts like change management and team building.</p>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> <li>1. Understand the fundamental concepts and terms of system analysis and system design</li> <li>2. Describe SDLC model and explain all phases in systems development.</li> <li>3. Discuss various approaches of systems analysis and design also explain their strengths and weaknesses.</li> <li>4. Understand how to plan for the project by using scheduling techniques (Break down structure)</li> <li>5. Understand and explain how to use Gantt and Pert Chart</li> <li>6. Explain information gathering techniques (interview, questionnaire)</li> <li>7. Understand how to estimate time, effort and the number of staff</li> <li>8. Identify the capabilities and experiences that must be available in the work team</li> <li>9. Developing the student's vision of the reality of the traditional systems used and looking at them in a scientific and systematic way, and this is reflected even on non-computer systems or projects in terms of the feasibility study and the possibility of developing them and achieving the required profitability</li> <li>10. Achieving steps towards the future to provide a systems analyst</li> </ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p><b>Indicative content includes the following.</b></p> <p><b><u>Part A – Introduction to System Analysis &amp; Design</u></b></p> <p>The system analyst,                  The system development life cycle (SDLC),                  Building an information system steps,                  SDLC fundamental phases.</p> <p><b>Planning</b>, Goal, Steps, Deliverable,  <b>Analysis</b>, Goal, Steps, Deliverable.  <b>Design</b>, Goal, Steps, Deliverable,  <b>Implementation</b>, Goal, Steps, Deliverable,  <b>Systems development methodologies</b>,                  Systems analysis and design methodology (SADM),                  Methodologies source,                  Categorize methodologies,                  Process-centered,                  Data-centered,                  Object oriented.  <b>Structured Design( SSADM),</b></p>

	<p><b>Waterfall</b> development technique, Advantages, Disadvantages,  Parallel <b>development</b> technique, Advantages, Disadvantages.  <b>Rapid Application Development (RAD)</b>,  <b>Phased</b> development technique, Advantages, Disadvantages.  <b>Prototyping</b> technique, Advantages, Disadvantages,  <b>Throwaway prototyping</b> technique, Advantages, Disadvantages.  <b>Agile Development</b>,  <b>Extreme programming</b> technique, Advantages, Disadvantages,  <b>Selecting appropriate development methodology</b>,  Project Team Roles and Skills,  <b>Business Analyst</b>, Roles, Skills, Interests, Phases,  <b>Systems Analyst</b>, Roles, Skills, Interests, Phases,  <b>Infrastructure Analyst</b>, Roles, Skills, Interests, Phases,  <b>Change Management Analyst</b>, Roles, Skills, Interests, Phases,  <b>Project Manager</b>, Roles, Skills, Interests, Phases</p>	[20 hrs]
	<p>Weekly Tutorial  General Discussion, <b>Assignments 1</b>  <b>Evaluation</b>  <b>Evaluation</b></p>	[8 hrs]
	<p><b><u>Part B – The Relational Algebra</u></b>  <b>Project Management</b>,  Identifying Project Size,  <b>Estimate System Size</b>,  Function point approach,  Total Unadjusted Function Points (TUF),  Adjusted Project Complexity (APC),  Total Adjusted Function Points (TAFP),  Complexity  <b>Estimate Required Effort</b>,  <b>Estimate Time Required</b>,  <b>Estimate the Number of Staff</b>,  <b>Exercises</b>  <b>Creating and Managing the Work plan</b>,  Identifying Tasks,  Work Breakdown Structure (WBS),  Constructing a WBS,  Reasons for creating a WBS  <b>Diagram</b>,  Gantt Chart,  Pert Chart  Critical path method (CPM),  Staffing the project</p>	[10 hrs]
	<p>Weekly Tutorial  General Discussion, <b>Assignments 1</b>  <b>Evaluation</b>  <b>Evaluation</b></p>	[7 hrs]

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<p>The module is delivered through a series of lectures. The lecture sessions discuss and explain to students the theoretical underpinnings of how software systems are analyzed and designed.</p> <p>Assessment is divided into four elements. First there are at least two quizzes that assess the student's competency in specific topics, also students will be ready for about five assignments evaluation, there is also a midterm class test, finally, there is an end of semester exam that tests the understanding of students for the theoretical material.</p>
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## Student Workload (SWL)

### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	62	<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	88	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	6
<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)	4, 9	LO #1,2,.....,8,9
	<b>Assignments</b>	5	15% (10)	2,3,5,6,8,9,11,12,14,15	LO #1,2,....., 14,15
	<b>Project/ Lab.</b>				
	<b>Midterm Exam</b>	2hr	25% (10)	7,11	LO #1,2,.....,10,11
<b>Summative assessment</b>					
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	<b>Introduction to Systems Analysis</b> The system analyst, The system development life cycle (SDLC), Building an information system steps, SDLC fundamental phases
<b>Week 2</b>	<b>Planning</b> , Goal, Steps, Deliverable, <b>Analysis</b> , Goal, Steps, Deliverable
<b>Week 3</b>	<b>Design</b> , Goal, Steps, Deliverable, <b>Implementation</b> , Goal, Steps, Deliverable,
<b>Week 4</b>	<b>Systems development methodologies</b> , Systems analysis and design methodology (SADM), Methodologies source, Categorize methodologies, Process-centered, Data-centered, Object oriented
<b>Week 5</b>	<b>Structured Design( SSADM)</b> , <b>Waterfall</b> development technique, Advantages, Disadvantages, <b>Parallel development</b> technique, Advantages, Disadvantages
<b>Week 6</b>	<b>Rapid Application Development (RAD)</b> , <b>Phased</b> development technique, Advantages, Disadvantages
<b>Week 7</b>	<b>Prototyping</b> technique, Advantages, Disadvantages, <b>Throwaway prototyping</b> technique, Advantages, Disadvantages
<b>Week 8</b>	<b>Agile Development</b> , <b>Extreme programming</b> technique, Advantages, Disadvantages,
<b>Week 9</b>	<b>Selecting appropriate development methodology</b> , Project Team Roles and Skills, <b>Business Analyst</b> , Roles, Skills, Interests, Phases,
<b>Week 10</b>	<b>Systems Analyst</b> , Roles, Skills, Interests, Phases, <b>Infrastructure Analyst</b> , Roles, Skills, Interests, Phases, <b>Change Management Analyst</b> , Roles, Skills, Interests, Phases, <b>Project Manager</b> , Roles, Skills, Interests, Phases
<b>Week 11</b>	<b>Project Management</b> , Identifying Project Size, <b>Estimate System Size</b> , Function point approach, Total Unadjusted Function Points (TUPF), Adjusted Project Complexity (APC), Total Adjusted Function Points (TAFP), Complexity
<b>Week 12</b>	<b>Estimate Required Effort</b> , <b>Estimate Time Required</b> , <b>Estimate the Number of Staff</b> , <b>Exercises</b>
<b>Week 13</b>	<b>Creating and Managing the Work plan</b> , Identifying Tasks, Work Breakdown Structure (WBS), Constructing a WBS, Reasons for creating a WBS
<b>Week 14</b>	<b>Diagram</b> , Gantt Chart, Pert Chart
<b>Week 15</b>	Critical path method (CPM), Staffing the project
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

## Delivery Plan (Weekly Tut. Syllabus)

### المنهاج الاسبوعي للمناقشة

	Material Covered
<b>Week 1</b>	General Discussion, <b>Assignments 1</b>
<b>Week 2</b>	<b>Evaluation</b>
<b>Week 3</b>	<b>Evaluation</b>
<b>Week 4</b>	General Discussion, <b>Assignments 2</b>
<b>Week 5</b>	<b>Evaluation</b>
<b>Week 6</b>	<b>Evaluation</b>

<b>Week 7</b>	General Discussion, <b>Assignments 3</b>
<b>Week 8</b>	<b>Evaluation</b>
<b>Week 9</b>	<b>Evaluation</b>
<b>Week 10</b>	General Discussion, <b>Assignments 4</b>
<b>Week 11</b>	<b>Evaluation</b>
<b>Week 12</b>	<b>Evaluation</b>
<b>Week 13</b>	General Discussion, <b>Assignments 5</b>
<b>Week 14</b>	<b>Evaluation</b>
<b>Week 15</b>	<b>Evaluation</b>

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	<ul style="list-style-type: none"> <li>System Analysis Design UML Version 2. An Object-Oriented Approach 3<sup>rd</sup> Edition, Alan Dennis</li> </ul>	No
<b>Recommended Texts</b>	<ul style="list-style-type: none"> <li>System Analysis Design UML Version 2. An Object-Oriented Approach 3<sup>rd</sup> Edition, Alan Dennis</li> </ul>	No
<b>Websites</b>	<a href="https://www.edouniversity.edu.ng/oorrepository/articles/system_analysis_and_design_lecture_note.pdf">https://www.edouniversity.edu.ng/oorrepository/articles/system_analysis_and_design_lecture_note.pdf</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	Computer Organization and Architecture		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	UoB12345		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Name	e-mail	E-mail
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	01/06/2023	Version Number	1.0

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

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b></p> <p>أهداف المادة الدراسية</p>	<p>Here are some module aims typically associated with a Computer Organization &amp; Architecture course. These aims describe the overarching goals and objectives of the course:</p> <ol style="list-style-type: none"><li>1. To provide students with a solid understanding of the fundamental concepts and principles of computer organization and architecture.</li><li>2. To introduce students to the components and operation of a computer system, including the CPU, memory, and I/O subsystems.</li><li>3. To familiarize students with the Von Neumann architecture and its role in modern computer systems.</li><li>4. To develop students' understanding of digital logic and Boolean algebra, enabling them to design and analyze combinational and sequential logic circuits.</li><li>5. To introduce students to different number systems and their representations in digital systems.</li><li>6. To explore the principles of data representation and arithmetic, including signed number representations and arithmetic operations.</li><li>7. To introduce students to the concepts and techniques of instruction-level parallelism and pipelining.</li><li>8. To enable students to analyze and resolve hazards and dependencies in pipelined architectures.</li><li>9. To provide students with a comprehensive understanding of memory systems, including cache memory organization and virtual memory concepts.</li><li>10. To introduce students to I/O systems, interfaces, and programming techniques.</li><li>11. To familiarize students with microprocessor architecture and programming, including instruction set architecture (ISA) and assembly language programming.</li><li>12. To develop students' ability to evaluate and optimize the performance of computer systems.</li><li>13. To introduce students to parallel processing and multicore architectures, including the principles of cache coherence and synchronization.</li><li>14. To explore emerging trends and technologies in computer organization and architecture, such as quantum computing and cloud computing.</li></ol> <p>This module aims to provide a broad overview of the goals and objectives of a Computer Organization &amp; Architecture course.</p>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>Here are some module learning outcomes that are typically associated with a Computer Organization &amp; Architecture course. These outcomes represent the knowledge, skills, and competencies that students are expected to achieve upon completing the course:</p> <ol style="list-style-type: none"><li>1. Understand the fundamental components and principles of computer organization and architecture.</li><li>2. Demonstrate knowledge of the Von Neumann architecture and its components.</li><li>3. Explain the instruction execution cycle and the role of the CPU.</li><li>4. Analyze and design combinational and sequential logic circuits.</li><li>5. Demonstrate an understanding of number systems and their representations in digital systems.</li></ol>

	<ol style="list-style-type: none"> <li>6. Explain the principles of data representation and arithmetic operations.</li> <li>7. Understand the concepts and techniques of instruction-level parallelism and pipelining.</li> <li>8. Analyze and resolve hazards and dependencies in pipelined architectures.</li> <li>9. Describe the organization and hierarchy of memory systems, including cache memory.</li> <li>10. Understand virtual memory concepts and address translation mechanisms.</li> <li>11. Explain I/O systems, interfaces, and programming techniques.</li> <li>12. Understand the principles of microprocessor architecture and programming.</li> <li>13. Analyze and evaluate the performance of computer systems.</li> <li>14. Understand the principles and techniques of parallel processing and multicore architectures.</li> <li>15. Identify and discuss emerging trends and technologies in computer organization and architecture.</li> </ol> <p>These module learning outcomes reflect the core knowledge and skills that students are expected to gain throughout the course.</p> <p>15.</p>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Here are some indicative contents for a Computer Organization &amp; Architecture course targeted at beginners. These contents cover the fundamental concepts and topics typically included in such a course:</p> <ol style="list-style-type: none"> <li>1. Introduction to Computer Systems <ul style="list-style-type: none"> <li>• Overview of computer organization and architecture</li> <li>• Basic components of a computer system</li> <li>• Von Neumann architecture and its principles</li> </ul> </li> <li>2. Number Systems and Digital Logic <ul style="list-style-type: none"> <li>• Binary, decimal, and hexadecimal number systems</li> <li>• Boolean algebra and logic gates</li> <li>• Combinational and sequential logic circuits</li> </ul> </li> <li>3. Data Representation <ul style="list-style-type: none"> <li>• Binary representation of integers and characters</li> <li>• Signed number representation (sign-magnitude, one's complement, two's complement)</li> <li>• Floating-point representation</li> </ul> </li> <li>4. Central Processing Unit (CPU) <ul style="list-style-type: none"> <li>• CPU components and organization</li> <li>• Instruction execution cycle</li> <li>• CPU performance and factors affecting it.</li> </ul> </li> <li>5. Memory Systems <ul style="list-style-type: none"> <li>• Memory hierarchy and its importance</li> <li>• Primary memory (RAM, ROM) and secondary storage (hard drives, solid-state drives)</li> <li>• Caches and cache organization</li> </ul> </li> <li>6. Instruction Set Architecture (ISA) <ul style="list-style-type: none"> <li>• Overview of instruction sets and their formats.</li> <li>• Addressing modes and instruction types</li> <li>• Instruction decoding and execution.</li> </ul> </li> <li>7. Input/Output Systems <ul style="list-style-type: none"> <li>• I/O devices and interfaces</li> <li>• I/O communication methods (programmed I/O, interrupt driven. I/O, DMA)</li> <li>• I/O performance and bottlenecks</li> </ul> </li> </ol>

	<ol style="list-style-type: none"> <li>8. Processor Design and Organization <ul style="list-style-type: none"> <li>• Basic CPU design principles (fetch-decode-execute cycle)</li> <li>• Instruction pipelining and hazards.</li> <li>• Control unit and microprogramming</li> </ul> </li> <li>9. Computer Arithmetic <ul style="list-style-type: none"> <li>• Binary arithmetic operations (addition, subtraction, multiplication, division)</li> <li>• Fixed-point and floating-point arithmetic</li> <li>• Arithmetic logic unit (ALU) design</li> </ul> </li> <li>10. Introduction to Assembly Language Programming <ul style="list-style-type: none"> <li>• Basics of assembly language programming</li> <li>• Instruction syntax and addressing modes.</li> <li>• Simple assembly programs and debugging</li> </ul> </li> <li>11. Introduction to Parallel Processing <ul style="list-style-type: none"> <li>• Concepts of parallel processing and its importance</li> <li>• Flynn's taxonomy (SISD, SIMD, MISD, MIMD)</li> <li>• Multicore processors and their organization</li> </ul> </li> <li>12. Emerging Trends in Computer Architecture <ul style="list-style-type: none"> <li>• Introduction to emerging technologies (quantum computing, neuromorphic computing)</li> <li>• Cloud computing and virtualization</li> <li>• Energy-efficient computing and green computing concepts</li> </ul> </li> </ol> <p>These indicative contents provide beginners with a solid foundation in computer organization and architecture.</p>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<p>When teaching a Computer Organization &amp; Architecture course to beginners, it's important to adopt strategies that cater to their foundational understanding and gradually build their knowledge and skills. Here are some effective learning and teaching strategies for beginners in a Computer Organization &amp; Architecture course:</p> <ol style="list-style-type: none"> <li>1. Visual Aids and Analogies: Use visual aids such as diagrams, charts, and illustrations to simplify complex concepts. Analogies comparing computer components to familiar real-world objects can make abstract ideas more relatable and easier to understand.</li> <li>2. Step-by-Step Approach: Break down complex topics into smaller, manageable steps. Present the material in a sequential manner, building upon previously covered concepts. This helps beginners grasp the fundamentals before moving on to more advanced topics.</li> <li>3. Direct Activities: Provide firsthand activities that allow beginners to interact with hardware components or simulation software. This can include assembling simple computer systems, performing basic circuit simulations, or writing simple programs. Direct activities reinforce learning and make abstract concepts more tangible.</li> <li>4. Practical Examples: Use practical examples and real-life scenarios to demonstrate the relevance and application of the concepts being taught. Relate the material to everyday situations or commonly used technologies to help beginners connect theory to practice.</li> </ol>

5. Scaffolding: Provide scaffolding support by gradually reducing assistance as students gain confidence and proficiency. Start with guided exercises and gradually increase the level of complexity and autonomy. This helps beginners develop their critical thinking skills and independent thinking.
6. Interactive Discussions: Encourage interactive discussions to promote active engagement and peer learning. Beginners can ask questions, share their perspectives, and learn from their classmates' experiences. This fosters a supportive learning environment where beginners can build their understanding collaboratively.
7. Concept Mapping and Summarizing: Encourage beginners to create concept maps or summaries of the material covered. Concept maps visually organize the relationships between different concepts, while summaries help reinforce understanding and retention.
8. Concrete Examples: Use concrete examples and familiar scenarios to explain abstract concepts. Relate computer organization and architecture to everyday experiences, such as explaining how a CPU functions like the brain of a computer or how cache memory is like a high-speed storage closet.
9. Incremental Assessments: Break assessments into smaller, incremental tasks to evaluate and reinforce learning along the way. This can include quizzes, short assignments, or mini projects that gradually increase in complexity as beginners progress through the course.
10. Encourage Questions: Create a supportive environment that encourages beginners to ask questions without hesitation. Answer questions patiently and provide explanations in a clear and accessible manner. This helps beginners clarify their doubts and deepen their understanding.
11. Provide Additional Resources: Offer supplementary resources, such as textbooks, online tutorials, and reference materials, to support beginners' learning outside the classroom. These resources can provide alternative explanations, additional examples, and further practice opportunities.
12. Regular Feedback and Guidance: Provide timely and constructive feedback on assignments and assessments to guide beginners' progress. Highlight their strengths and provide specific suggestions for improvement to help them grow and build confidence.

By employing these strategies, you can create an inclusive and supportive learning environment for beginners in a Computer Organization & Architecture course. Adjust the pace and depth of the course to accommodate their learning needs and gradually build their knowledge and skills in the subject.

### Student Workload (SWL)

#### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	45	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	80	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

## Module Evaluation

### تقييم المادة الدراسية

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

## Delivery Plan (Weekly Syllabus)

### المنهاج الأسبوعي النظري

	Material Covered
Week 1	Introduction to Computer Systems <ul style="list-style-type: none"> <li>• Basic components of a computer system</li> <li>• Overview of computer architecture and organization</li> </ul>
Week 2	Number Systems and Digital Logic <ul style="list-style-type: none"> <li>• Binary, decimal, and hexadecimal number systems</li> <li>• Logic gates and Boolean algebra</li> <li>• Combinational and sequential logic circuits</li> </ul>
Week 3	Basic Computer Organization <ul style="list-style-type: none"> <li>• Von Neumann architecture</li> <li>• CPU, memory, and I/O subsystems</li> <li>• Instruction execution cycle</li> </ul>
Week 4	Machine Language and Assembly Programming <ul style="list-style-type: none"> <li>• Machine language instructions</li> <li>• Assembly language programming concepts</li> <li>• Introduction to an assembly language (e.g., MIPS, x86)</li> </ul>
Week 5	Central Processing Unit (CPU) Design <ul style="list-style-type: none"> <li>• CPU components and their functions</li> <li>• Instruction set architecture (ISA)</li> <li>• CPU Datapath and control unit</li> </ul>
Week 6	1. Memory Systems <ul style="list-style-type: none"> <li>• Memory hierarchy</li> <li>• Cache memory organization and mapping techniques</li> <li>• Virtual memory concepts</li> </ul>
Week 7	Mid-term Exam
Week 8	Microprocessors and Microcontrollers <ul style="list-style-type: none"> <li>• Introduction to microprocessors and microcontrollers</li> <li>• Architecture and features of popular microprocessors (e.g., Intel 8086, ARM Cortex-M)</li> </ul>

<b>Week 9</b>	Instruction Set Architecture (ISA) <ul style="list-style-type: none"> <li>• Types of instruction formats</li> <li>• Addressing modes</li> <li>• Assembly language programming for the chosen ISA</li> </ul>
<b>Week 10</b>	Input/Output Systems <ul style="list-style-type: none"> <li>• I/O interfaces and devices</li> <li>• Interrupts and DMA (Direct Memory Access)</li> <li>• I/O programming techniques</li> </ul>
<b>Week 11</b>	Computer Arithmetic <ul style="list-style-type: none"> <li>• Binary and hexadecimal arithmetic</li> <li>• Integer and floating-point representations</li> <li>• Arithmetic operations and algorithms</li> </ul>
<b>Week 12</b>	Pipelining and Superscalar Techniques <ul style="list-style-type: none"> <li>• Pipelined CPU architecture</li> <li>• Instruction pipelining and hazards.</li> <li>• Superscalar and out-of-order execution</li> </ul>
<b>Week 13</b>	Advanced Topics in Computer Architecture <ul style="list-style-type: none"> <li>• Parallel processing and multiprocessors</li> </ul>
<b>Week 14</b>	Advanced Topics in Computer Architecture <ul style="list-style-type: none"> <li>• Memory management and protection</li> <li>• Performance evaluation and optimization techniques</li> </ul>
<b>Week 15</b>	General Discussion
<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:
<b>Week 2</b>	Lab 2:
<b>Week 3</b>	Lab 3:
<b>Week 4</b>	Lab 4:
<b>Week 5</b>	Lab 5:
<b>Week 6</b>	Lab 6:
<b>Week 7</b>	Lab 7:

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?

<b>Required Texts</b>	<p><b>"Computer Organization and Architecture: Designing for Performance" by William Stallings:</b></p> <ul style="list-style-type: none"> <li>➤ This textbook provides a comprehensive introduction to computer organization and architecture, with a focus on performance design principles. It covers topics such as CPU organization, memory hierarchy, instruction set architecture, and I/O systems. The book includes numerous examples, illustrations, and exercises to reinforce concepts.</li> </ul>	
<b>Recommended Texts</b>	<p><b>"Structured Computer Organization" by Andrew S. Tanenbaum and Todd Austin:</b></p> <ul style="list-style-type: none"> <li>➤ This book provides a structured approach to computer organization and architecture. It covers fundamental concepts, including digital logic, data representation, CPU organization, memory systems, and I/O systems. The text emphasizes the importance of hierarchical organization in computer systems and includes numerous examples and exercises to reinforce learning.</li> </ul>	
<b>Websites</b>		

<b>Grading Scheme</b> 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
<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

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Probability and Statistics</b>		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	<b>It 201</b>		
ECTS Credits	8		
SWL (hr/sem)	<b>200</b>		
Module Level	2	Semester of Delivery	
Administering Department	Computer science	College	Computer science and information technology
Module Leader	Mayada Mahdi hussien	e-mail	<a href="mailto:Maymaty6@gmail.com">Maymaty6@gmail.com</a>
Module Leader's Acad. Title	Ass.lech	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Mathematics of computing	Semester	1

## 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. It gives the student a broader idea of the possibility of things happening .</li><li>2. The probability of things gives more opportunity for imagination.</li><li>3. The moment- generating function gives him more opportunity to deal with the derivative of the moment- generating function.</li><li>4. The student will be qualified in the next stage to deal with probability and statistics, especially in the subject of simulation .</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>16. Understand the vocabulary of probability and statistics .</li><li>17. Understanding the nature of statistics as an integrated system of knowledge.</li><li>18. Developing student's statistical concepts.</li><li>19. An attempt to reach the concepts of probability and statistics .</li><li>20. The ability to solve complex statistical problems.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p><u>Part A – permutations and combinations</u> <u>Permutations mean dealing with ordered things, but harmonics, the order is unimportant.</u></p> <p><u>Part B- Probability</u> <u>Probability is a measure of the possibility of an event occurring. Probability is measured as a number between zero and one, where zero indicates impossibility and one indicates certainty. The higher the probability of an event, the greater the possibility of that event occurring.</u></p> <p><u>Part C- Distributions</u> <u>Connected and discreet distributions and how to deal with them.</u></p>

## Learning and Teaching Strategies

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

<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 - permutations and combinations
<b>Week 2</b>	Probability
<b>Week 3</b>	Conditional probability and bay's theorem
<b>Week 4</b>	Connected random variables
<b>Week 5</b>	Discrete random variables
<b>Week 6</b>	Functions of random variables
<b>Week 7</b>	Expectations
<b>Week 8</b>	Variances
<b>Week 9</b>	Moment – generating function

<b>Week 10</b>	Joint distributions and marginal distributions
<b>Week 11</b>	Discrete distributions
<b>Week 12</b>	Continuous distributions
<b>Week 13</b>	First exam
<b>Week 14</b>	Second exam
<b>Week 15</b>	Review important topics
<b>Week 16</b>	Preparatory week before the final Exam

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	كتاب سلسلة من الاحتمالات تأليف سيمور ليبشتز	Yes
<b>Recommended Texts</b>	كتاب مقدمة في الإحصاء الرياضي تأليف الدكتور صباح داود سليم	yes
<b>Websites</b>	Adobe reader-[simue-pdf] Probability et statistique cours et problemes series schaum	

### 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	<b>Object oriented programming II</b>		Module Delivery
Module Type	Core		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			
ECTS Credits	8		
SWL (hr/sem)			
Module Level	2	Semester of Delivery	
Administering Department	Cs	College	It
Module Leader	Name	e-mail	E-mail
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

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

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>THIS COURSE WILL PROVIDE A BASIC UNDERSTANDING OF THE METHODS AND TECHNIQUES OF DEVELOPING A SIMPLE TO MODERATELY COMPLEX WEB SITE. USING THE CURRENT STANDARD WEB PAGE LANGUAGE, STUDENTS WILL BE INSTRUCTED ON CREATING AND MAINTAINING A SIMPLE WEB SITE. AFTER THE FOUNDATION LANGUAGE HAS BEEN ESTABLISHED, THE AID OF AN WEB EDITOR WILL BE INTRODUCED. THIS COURSE WILL PROVIDE A RIGOROUS TREATMENT OF OBJECT - ORIENTED CONCEPTS (DESIGN AND IMPLEMENTATION OF OBJECTS, CLASS CONSTRUCTION AND DESTRUCTION, ENCAPSULATION, INHERITANCE, AND POLYMORPHISM) USING JAVA AS AN EXAMPLE LANGUAGE.</p>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<p>Introducing advanced entity programming.</p> <ul style="list-style-type: none"> <li>➤ How to use objects within programming as a modern concept and develop students' ability to programmatically</li> <li>➤ Enhancing the student's ability to think in abstract terms when solving computer science problems and diversity in solution problems in different ways and how to relate them to reality</li> <li>➤ Addressing advanced new concepts in programming such as multithreading, graphical user interface, and others.</li> </ul>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <ol style="list-style-type: none"> <li><u>1-Wrapper classes</u></li> <li><u>2-Inner classes</u></li> <li><u>3-Multithreading</u></li> <li><u>4-Generics</u></li> <li><u>5-GUI design</u></li> <li><u>6-Data base access</u></li> <li><u>7-Distribution</u></li> </ol>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<p><b>Strategies</b></p>	<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,</p>
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	interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	102	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	6.5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	200		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
<b>Summative assessment</b>	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	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>	Wrapper classes
<b>Week 2</b>	Wrapper classes

<b>Week 3</b>	Inner classes
<b>Week 4</b>	Inner classes
<b>Week 5</b>	Multithreading
<b>Week 6</b>	Multithreading
<b>Week 7</b>	Multithreading
<b>Week 8</b>	Generics
<b>Week 9</b>	Generics
<b>Week 10</b>	GUI design
<b>Week 11</b>	GUI design
<b>Week 12</b>	GUI design
<b>Week 13</b>	Data base access
<b>Week 14</b>	Data base access
<b>Week 15</b>	Distribution
<b>Week 16</b>	Distribution

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	Lab 1: Wrapper classes
<b>Week 2</b>	Lab 2: Inner classes
<b>Week 3</b>	Lab 3: -Multithreading
<b>Week 4</b>	Lab 4: Generics
<b>Week 5</b>	Lab 5: GUI design
<b>Week 6</b>	Lab 6: Data base access
<b>Week 7</b>	Lab 7: Distribution

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?

<b>Required Texts</b>	C. Thomas Wu (2010). An Introduction to Object-Oriented Programming with Java. Fifth Edition. McGraw-Hill.	Yes
<b>Recommended Texts</b>	2] Herbert Schildt (2007). Java: The Complete Reference. Seventh Edition. McGraw-Hill.	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
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	<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	Data Structures and Algorithms II		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 type="checkbox"/> Seminar
Module Code	CS207		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Name	e-mail	E-mail
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	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CS202	Semester	3
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>5. Master sorting and searching algorithms.</li> <li>6. Understand tree structures and traversal.</li> <li>7. Explore graph data structures and traversals.</li> <li>8. Learn efficient data storage and retrieval.</li> <li>9. Utilize versatile data structures.</li> <li>10. Study heap data structures and priority queues.</li> <li>11. Learn string matching algorithms.</li> <li>12. Analyze time and space complexity.</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>21. Apply sorting and searching algorithms effectively.</li> <li>22. Utilize tree structures and perform traversals.</li> <li>23. Analyze and solve problems using graph data structures and traversals.</li> <li>24. Implement efficient data storage and retrieval with hash tables.</li> <li>25. Employ maps, sets, multisets, and multimaps for various problem-solving scenarios.</li> <li>26. Utilize heaps and priority queues for efficient data organization.</li> <li>27. Apply string matching algorithms for text processing tasks.</li> <li>28. Analyze algorithm complexity in terms of time and space</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <ol style="list-style-type: none"> <li>1. Sorting and Searching Algorithms [2 weeks]</li> <li>2. Trees [2 weeks]</li> <li>3. Graphs [2 weeks]</li> <li>4. Hash Tables [1 week]</li> <li>5. Maps, Sets, Multisets, and Multimaps [1 week]</li> <li>6. Heaps [2 weeks]</li> <li>7. Text Processing [2 weeks]</li> <li>8. Algorithm Analysis [2 weeks]</li> </ol>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<p><b>Strategies</b></p>	<ol style="list-style-type: none"> <li>1. Lectures and interactive discussions</li> <li>2. Practical laboratory sessions</li> <li>3. Problem-solving exercises and tutorials</li> <li>4. Simulation tools and software</li> <li>5. Assessments (exams, projects) with feedback</li> </ol>
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<b>Student Workload (SWL)</b> الحمل الدراسي للطلاب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطلاب خلال الفصل	75	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطلاب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطلاب خلال الفصل	75	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطلاب 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	6% (6)	6, 13	LO #1-3 and 7
	<b>Assignments</b>	2	7% (7)	8, 15	LO # 4-6 and 8
	<b>Projects / Lab.</b>	1	17% (17)	Continuous	
	<b>Report</b>				
<b>Summative assessment</b>	<b>Exam</b>	2 hr	20% (20)	7	LO # 1-5
	<b>Final Lab</b>	2 hr	17% (17)		All
	<b>Final Exam</b>	3hr	33% (33)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	Material Covered
<b>Weeks 1-2</b>	Sorting and Searching: Bubble Sort, Quick Sort, Merge Sort, Sequential Search, Interval Search
<b>Weeks 3-4</b>	Trees: General trees, Binary trees, Tree traversal, Balanced Trees
<b>Weeks 5-6</b>	Graphs: Data Structures for Graphs, Graph Traversals, Shortest Paths
<b>Week 7</b>	Hash Tables
<b>Week 8</b>	Maps, Sets, Multisets, and Multimaps
<b>Week 9</b>	Exam I

<b>Weeks 10-11</b>	Heaps: The Heap Data Structure, Implementing a Priority Queue, with a Heap, Analysis of a Heap-Based Priority Queue, Bottom-Up Heap Construction
<b>Weeks 12-13</b>	Text Processing: String Matching algorithms
<b>Weeks 14-15</b>	Algorithm Analysis: Time Complexity, Space Complexity
<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: Sorting
<b>Week 2</b>	Lab 2: Searching
<b>Week 3</b>	Lab 3: Trees
<b>Week 4</b>	Lab 4: Trees
<b>Week 5</b>	Lab 5: Graphs
<b>Week 6</b>	Lab 6: Graphs
<b>Week 7</b>	Lab 7: Hash Tables
<b>Week 8</b>	Lab 8: Maps
<b>Week 9</b>	Lab 9: Sets
<b>Week 10</b>	Lab 10: Heaps
<b>Week 11</b>	Lab 11: Heaps
<b>Week 12</b>	Lab 12: Text Processing
<b>Week 13</b>	Lab 13: Text Processing
<b>Week 14</b>	Lab 14: Algorithm Analysis
<b>Week 15</b>	Lab 15: Algorithm Analysis

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Data Structures and Algorithms in Java. Michael T. Goodrich, Roberto Tamassia, and Michael H. Goldwasser. 6th Edition. 2014 John Wiley & Sons, Inc.	No

<b>Recommended Texts</b>	Data Structures and Abstractions with Java™. Frank M. Carrano and Timothy M. Henry. Fifth Edition 2019 Pearson Education, Inc.	No
<b>Websites</b>	<a href="https://www.javatpoint.com/data-structure-tutorial">https://www.javatpoint.com/data-structure-tutorial</a>	

<b>Grading Scheme</b> 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
<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

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Computation Theory</b>		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	<b>CS205</b>		
ECTS Credits	5		
SWL (hr/sem)	<b>125</b>		
Module Level	2	Semester of Delivery	
Administering Department	Computer Science dept.	College	College of computer science and information technology
Module Leader	Name	e-mail	E-mail
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	/06/2023	Version Number	1.0

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

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b></p> <p>أهداف المادة الدراسية</p>	<p>The aim of this course is to introduce students to the fundamental area of computer science which enables students to focus on the study of abstract models of computation.</p> <p>These abstract models allow the students to assess via formal reasoning what could be achieved through computing when they are using it to solve problems in science and engineering.</p> <p>The goal is to allow them to answer fundamental questions about problems, such as whether they can or not be computed.</p> <p>The course introduces basic computation models and their properties. The students will be able to express computer science problems as mathematical statements and to formulate proofs.</p>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<p style="text-align: center;">A- Knowledge and understanding :</p> <ul style="list-style-type: none"> <li>- Clarifying the basic concepts in computational theory through a set of tools.</li> <li>-Gaining skills in problem-solving.</li> <li>-Acquisition of basic skills as an introduction to building languages.</li> <li>-Acquisition of theoretical concepts to deal with RE's, DFA's, NFA's, Stack's, Turing machines, and Grammars.</li> </ul> <p style="text-align: center;">B- Subject-specific skills :</p> <p>B1 - The ability to design (FAs, NFAs, Grammar, languages modelling, small compilers basics).</p> <p>B2 - The ability to think about solving the problem according to specific rules.</p> <p>B3 - Writing scientific reports</p> <p>B4 - Know the comparison between (Natural and Formal Languages).</p>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<ul style="list-style-type: none"> <li>- In theoretical computer science, the theory of computation is the branch that deals with whether and how efficiently problems can be solved on a model of computation, using an algorithm. The field is divided into three major branches: automata theory, computability theory and computational complexity theory .</li> <li>- The main purpose of the theory of computation is to develop a formal mathematical model of computation that reflects the real world. computers.</li> <li>- The student can read about these basic topics in order to guide him in the subject of computational theory. These topics are: ( Theory of computation, Language Concepts, Grammar Concepts, Finite State Machine, Deterministic finite automaton, Non-</li> </ul>

	deterministic Finite State Machine, Regular Languages, Regular Expression, pumping Lemma, Context Free Grammar, FSM Summary, Context-Free Languages, Ambiguity).
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<ul style="list-style-type: none"> <li>- Readings, self-learning, panel discussions.</li> <li>- Classroom exercises and activities.</li> <li>- Guiding students to some websites to benefit from them to develop abilities.</li> <li>- Holding research seminars through which some problems are explained and analyzed and the mechanism for finding solutions.</li> </ul> <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	80	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	45	<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	125		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	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	<ul style="list-style-type: none"> <li>- General information about Computation.</li> <li>- Representing Information.</li> <li>- Computational Problems.</li> <li>- Characteristics of computational problems</li> <li>- Theory of computation</li> </ul>
Week 2	<ul style="list-style-type: none"> <li>- Language Concepts</li> <li>- Grammar Concepts</li> <li>- Chomsky Classification of Grammars</li> <li>- Finite State Machine</li> <li>- How does a Automaton work ?</li> </ul>
Week 3	<ul style="list-style-type: none"> <li>- Machine view of FA</li> <li>- How to define a FA</li> <li>- FA diagrams</li> <li>- Characteristics of state machine</li> <li>- Deterministic finite automaton DFA</li> <li>- Examples of DFA .</li> </ul>
Week 4	<ul style="list-style-type: none"> <li>- Non deterministic Finite State Machine (NFA)</li> <li>- NFA operation</li> <li>- Examples of NFA</li> <li>- DFA Vs. NFA</li> </ul>
Week 5	<ul style="list-style-type: none"> <li>- Equivalence of Machines</li> <li>- Example of equivalent machines</li> <li>- Proof by construction</li> </ul>

<b>Week 6</b>	<ul style="list-style-type: none"> <li>- Properties of Regular Languages</li> <li>- Definition (Regular Languages)</li> <li>- Union Operation &amp; Examples</li> <li>- Concatenation Operation &amp; Examples</li> <li>- Star Operation &amp; Examples</li> </ul>
<b>Week 7</b>	<ul style="list-style-type: none"> <li>- Reversal Operation &amp; Examples</li> <li>- Complement Operation &amp; Examples</li> <li>- Intersection Operation &amp; Examples</li> <li>- De Morgan's Law &amp; Example</li> </ul>
<b>Week 8</b>	<ul style="list-style-type: none"> <li>- DFA Minimization</li> <li>- Equivalence theorem.</li> <li>- Draw the equivalent DFA</li> <li>- Minimization of DFA Table Filling Method</li> </ul>
<b>Week 9</b>	<ul style="list-style-type: none"> <li>- Myhill-Nerode Theorem</li> <li>- Regular Languages &amp; examples</li> <li>- Regular Expression &amp; examples.</li> </ul>
<b>Week 10</b>	<ul style="list-style-type: none"> <li>- automata theory ( Basics , Inductions , Precedence of Operators , Examples , Identities , Facts )</li> <li>- Equivalence of RE's and Automata .</li> </ul>
<b>Week 11</b>	<ul style="list-style-type: none"> <li>- Converting a RE to an <math>\epsilon</math>-NFA</li> <li>- Form of <math>\epsilon</math>-NFA s Constructed</li> <li>- RE to <math>\epsilon</math>-NFA : ( Union, Concatenation, Closure, Examples)</li> <li>- DFA to RE</li> <li>- Algebraic Laws for RE's</li> </ul>
<b>Week 12</b>	<ul style="list-style-type: none"> <li>- Convert Automata into RegEx using State Elimination</li> <li>- pumping Lemma</li> <li>- Theorem to Proof Language is Regular</li> <li>- Theorem to Proof Language is Not Regular</li> <li>- Pigeonhole Principle and FSA</li> </ul>
<b>Week 13</b>	<ul style="list-style-type: none"> <li>- Theorem – Long Strings</li> <li>- Line of Reasoning</li> <li>- Examples of Pumping Lemma</li> </ul>
<b>Week 14</b>	<ul style="list-style-type: none"> <li>- Context Free Grammar</li> <li>- FSM Summary</li> <li>- Context-Free Languages</li> <li>- Chomsky Hierarchy</li> </ul>
<b>Week 15</b>	<ul style="list-style-type: none"> <li>- Derivation of Context-Free Languages</li> <li>- Derivation Trees , Examples</li> <li>- Ambiguity , Examples .</li> </ul>
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	none

## Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	( Michael Sipser), Introduction to the Theory of computation (Third Edition ).	Yes
Recommended Texts	Theory of Computation Simplified , ( Varsha H. Patil , Vaishali S. Pawar ,Swati A. Bhavsar) , 2022 .	No
Websites	<a href="https://elc.uobasrah.edu.iq/enrol/index.php?id=72">https://elc.uobasrah.edu.iq/enrol/index.php?id=72</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

## Database Systems-CS209

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Database Systems</b>		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	<b>CSITCS209</b>		
ECTS Credits	6		
SWL (hr/sem)	<b>150</b>		
Module Level	2	Semester of Delivery	
Administering Department	Computer Science	College	College of Information Technology
Module Leader	Baida'a AbdulQader Khudor	e-mail	Bidaa.khudur@uobasrah.edi.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ms.c.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CSITCS204-System analysis and design	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>The objective of this course is to introduce students to database management systems. It helps the student to present an actual practical project on realistic interaction and acquisition of skills by collecting information and dealing with a real institution through open discussion with the professor and his fellow students. Topics include</p> <ol style="list-style-type: none"> <li>1. Data, Information, and File system</li> <li>2. Database and database users</li> <li>3. Database system concepts and architecture</li> <li>4. Data modeling using the Entity Relationship Diagram (ERD)</li> <li>5. The relational data model and relational data constraints</li> <li>6. Functional dependencies and normalization for relational databases</li> <li>7. The Relational Algebra,</li> <li>8. Relational database design for ER to relational mapping</li> <li>9. Organization records in the file</li> <li>9. Disk storage, basic file structure and hashing,</li> <li>10. SQL schema definition, constraints, queries and views.</li> <li>11. Acquisition of skills by using some functions of MSAccess.</li> </ol>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>11. Understanding the concept of relational databases.</li> <li>12. Describe database concepts and architecture including query processing and optimization.</li> <li>13. Design logical and mathematical models to organize data within a database.</li> <li>14. Learn about the capabilities of Microsoft Access in designing Database.</li> <li>15. Preparing the student to design a database of medium complexity using Access tools.</li> <li>16. The student gains self-confidence as a result of acquiring knowledge of how to deal with data and organize them into tables that facilitate the process of storage and retrieval.</li> <li>17. Develop skills to work in a group project to produce quality deliverables.</li> <li>18. At the end of the chapter, the student achieves theoretical knowledge and practical capabilities in building an integrated database system</li> </ol>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p><b>Indicative content includes the following.</b></p> <p><b><u>Part A – Introduction to Database</u></b>            Data, Information, Data Base (DB), Relational Data Base (RDB), Data Base Management System (DBMS). Characteristics of Database, Advantages and Disadvantages, Main phases of database design, Constructing an ER model, ER Diagram Symbols and Notations, Cardinality and Ordinality, How to Draw ER Diagrams, ER Diagram Best Practices. [14 hrs]</p> <p>Getting to know the Access interface, Create Database, Create &amp; Design tables, Create table relationships, Make a dropdown list, Create &amp; Design Query, Change the name of a field within the query, Add a calculated field to the query table, &amp; Evaluation. [8 hrs]</p> <p><b><u>Part B – The Relational Algebra</u></b></p>

	<p>THE RELATIONAL ALGEBRA, Unary relational operations: SELECT and PROJECT, Sequences of Operations and the RENAME Operation, Operations from set theory, The Cartesian product Operation, Binary Relational Operations. [8 hrs]</p> <p>Using <b>Datepart</b> function, Using <b>DateDiff</b> function to find the difference between two dates, Create compound conditions, Using Logical operators, comparative and Like operators, &amp; Evaluation.[8 hrs]</p> <p><b>Part C – Files and Records</b></p> <p>Files and Records, Organizing records in the file, Organizing Files on Disk, File Headers, Hashing Techniques, &amp; Hashing Function. [8 hrs]</p> <p>Using <b>IIF</b> function, Using <b>Switch</b> function, &amp; Evaluation.[6 hrs]</p>
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### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

<b>Strategies</b>	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their thinking skills. This will be achieved through classes, Labs. and interactive discussions.
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### Student Workload (SWL)

#### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	77	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	73	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.86
<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 #1,2,3,4,5,6,7,8
	<b>Assignments</b>	1	5% (5)	12	LO #1,2,3,4,5,6,7,8
	<b>Assignments Lab.</b>	1	10% (10)	Continuous	
	<b>Midterm Exam</b>	2hr	25% (10)	8,12	LO #12,3,4,5,6,7,8
<b>Summative assessment</b>	<b>Final Exam</b>	3hr	35% (50)	16	All
	<b>Final Lab. Exam</b>	1hr	15%(15)	16	All
<b>Total assessment</b>			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

#### المنهاج الأسبوعي النظري

	<b>Material Covered</b>
<b>Week 1</b>	<b>Introduction to Database</b> Data, Information, Data Base (DB), Relational Data Base (RDB), Data Base Management System (DBMS)
<b>Week 2</b>	<b>Characteristics of Database</b> , Advantages and Disadvantages
<b>Week 3</b>	<b>Main phases of database design</b> Phase1, Phase2, ER Diagram, Main components of ER Diagram, Entities, Entity Attributes, Domain
<b>Week 4</b>	<b>Main phases of database design</b> Primary Key, Foreign Keys, Types of Relation Ships, Phase3, Phase4
<b>Week 5</b>	<b>Constructing an ER model</b> Attributes Types, Single, Multivalued, Compound, Derived, Stored, Key & Optional Attribute.
<b>Week 6</b>	<b>ER Diagram Symbols and Notations</b> Entity, Weak Entity, Attribute, Multivalued Attribute, Derived Attribute, Key Attribute, Relationship. <b>Cardinality and Ordinality</b>
<b>Week 7</b>	How to Draw ER Diagrams, ER Diagram Best Practices, Exercises.
<b>Week 8</b>	<b>THE RELATIONAL ALGEBRA</b> Unary Relational Operations: SELECT and PROJECT, Sequences of Operations and the RENAME Operation
<b>Week 9</b>	<b>THE RELATION AL ALGEBRA</b> Relational Algebra Operations from Set Theory: A. UNION, INTERSECTION, and MINUS B. The CARTESIAN PRODUCT (CROSS PRODUCT) Operation
<b>Week 10</b>	<b>THE RELATIONAL ALGEBRA</b> Binary Relational Operations: JOIN and DIVISION 1. The Join Operation A. Inner join, Variations of JOIN (The EQUIJOIN and NATURAL JOIN)
<b>Week 11</b>	<b>THE RELATIONAL ALGEBRA</b> B. Outer join: Left Outer Join, Right Outer Join Precedence of relational Operations 2. The Division Operation
<b>Week 12</b>	<b>Files and Records</b> Records and Record Types, Fixed Length Records, Formatting records of a file of Fixed length records, Variable Length Records, Formatting records of a file of variable-length records (Other options), Formatted a file of records with optional fields, Formatting A repeating field, Formatting file that includes records of different types
<b>Week 13</b>	<b>Organizing records in the file</b> Record Blocking and Spanned vs Un spanned Records <b>Organizing Files on Disk</b> Allocating File Blocks on Disk: Contiguous allocation, Linked allocation, Indexed allocation
<b>Week 14</b>	<b>File Headers</b> , Files of Unordered Records (Heap Files),Files of Ordered Records (Sorted Files)
<b>Week 15</b>	<b>Hashing Techniques</b> : Hash table, The idea behind hashing <b>Hashing Function</b> : Direct, Subtraction, & Modulo Division Hashing
<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: Introduction to MS-Access, Getting to know the Access interface, Create Database,
<b>Week 2</b>	Lab 2: Create & Design tables, Create tables relationships
<b>Week 3</b>	<b>Lab 3: Evaluation</b>
<b>Week 4</b>	Lab 4: Make a dropdown list, Create & Design Query
<b>Week 5</b>	Lab 5: Using zoom window and write some codes, Change the name of a field within a query
<b>Week 6</b>	<b>Lab 6:</b> Add a calculated field to the query table
<b>Week 7</b>	<b>Lab 7: Evaluation</b>
<b>Week 8</b>	<b>Lab 8:</b> Using <b>Datepart</b> function
<b>Week 9</b>	Lab 9: Using <b>DateDiff</b> function to find the difference between two dates
<b>Week 10</b>	Lab 10: Create compound conditions, Using Logical operators, comparative and Like operators
<b>Week 11</b>	<b>Lab 11: Evaluation</b>
<b>Week 12</b>	Lab 12: Using <b>IIF</b> function
<b>Week 13</b>	<b>Lab 13: Evaluation</b>
<b>Week 14</b>	Lab 14: Using <b>Switch</b> function
<b>Week 15</b>	<b>Lab 15: Evaluation</b>

## Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	<ul style="list-style-type: none"> <li>Database System Concepts Fourth Edition" by Abraham Silberschatz Henry F. Korth S. Sudarshan , McGraw-Hill ISBN 0-07-255481-9</li> <li>Database Concepts 6<sup>th</sup> Edition, David M. Kroenke, David J. Auer</li> </ul>	No
<b>Recommended Texts</b>	<ul style="list-style-type: none"> <li>Access 2013 the missing manual, Matthew macdonald</li> <li>FUNDAMENTALS OF Database Systems 6th EDITION, Ramez Elmasri</li> </ul>	No
<b>Websites</b>	<a href="https://link.springer.com/book/10.1007/978-3-540-48399-1">https://link.springer.com/book/10.1007/978-3-540-48399-1</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	<b>Web Development</b>		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory
Module Code			<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		College	CSIT
Module Leader	Dr. Raad A. Muhajjar	e-mail	Raad.muhammad@uobasrah.edu.iq
Module Leader's Acad. Title	Lecturer	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	15/06/2023	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	

<p><b>Module Objectives</b></p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Understand the concept of static web design and its advantages and limitations.</li> <li>2. Gain proficiency in HTML (Hypertext Markup Language) and CSS (Cascading Style Sheets) as the primary technologies for creating static web pages.</li> <li>3. Learn the fundamental structure of HTML, including tags, elements, attributes, and their usage in creating web content.</li> <li>4. Develop skills in creating and formatting different types of content, such as text, images, links, lists, tables, and forms using HTML.</li> <li>5. Explore the principles of CSS and learn how to apply styles to HTML elements, including fonts, colors, backgrounds, margins, and padding.</li> <li>6. Understand the box model in CSS and its significance in controlling the layout and positioning of elements on a web page.</li> <li>7. Learn techniques for creating responsive web designs that adapt to different screen sizes and devices.</li> </ol>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>When completing a web programming module focused on PHP, the student can gain the following learning outcomes:</p> <ol style="list-style-type: none"> <li>1. Demonstrate a solid understanding of the concept of static web design and its purpose in creating websites.</li> <li>2. Create well-structured and semantically correct HTML markup for static web pages.</li> <li>3. Apply CSS styles effectively to enhance the visual presentation and layout of web content.</li> <li>4. Construct responsive web designs that adapt gracefully to different screen sizes and devices.</li> <li>5. Implement navigation menus, headers, footers, and other common components of static websites.</li> <li>6. Optimize web graphics and images for faster loading times without sacrificing quality.</li> <li>7. Incorporate accessibility considerations into web design to ensure inclusivity and compliance with accessibility standards.</li> <li>8. Test and debug static web pages to ensure proper functionality across different browsers and devices.</li> <li>9. Organize and manage website files and directories efficiently for ease of maintenance and scalability.</li> <li>10. Demonstrate knowledge of best practices in static web design, including code documentation, version control, and collaboration techniques.</li> <li>11. These learning outcomes reflect the skills and knowledge you should acquire upon completing the module on static web design. Mastery of these outcomes will enable you to design and build visually appealing, functional, and accessible static websites using HTML and CSS.</li> </ol>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<ol style="list-style-type: none"> <li>1. Introduction to Static Web Design: <ul style="list-style-type: none"> <li>• Overview of static web design and its role in website development.</li> <li>• Understanding the differences between static and dynamic websites.</li> <li>• Exploring the benefits and limitations of static web design.</li> </ul> </li> <li>2. HTML Fundamentals: <ul style="list-style-type: none"> <li>• Introduction to HTML markup and its structure.</li> </ul> </li> </ol>

- Understanding HTML tags, elements, and attributes.
- Creating and formatting text, headings, paragraphs, and lists.
- Working with links, images, and multimedia content.
- Creating tables for data representation.

### 3. CSS Basics:

- Introduction to CSS and its role in styling web pages.
- Understanding CSS syntax, selectors, and properties.
- Applying colors, backgrounds, and borders to elements.
- Controlling typography and font styles.
- Managing spacing and layout using margins, padding, and the box model.

### 4. Layout and Responsive Design:

- Creating multi-column layouts using CSS.
- Understanding the concept of responsive web design.
- Using media queries to adapt layouts for different screen sizes.
- Implementing flexible grids and fluid images.
- Applying responsive techniques to navigation menus and other elements.

### 5. Web Graphics and Optimization:

- Optimizing images for web display, including compression techniques.
- Working with icon fonts and scalable vector graphics (SVG).
- Understanding the impact of file formats and sizes on page load times.
- Implementing techniques to improve web performance, such as caching and minification.

### 6. Accessibility and Best Practices:

- Understanding the importance of web accessibility.
- Implementing accessibility features, such as alternative text for images and proper semantic markup.
- Following best practices for clean and maintainable code.
- Introduction to version control systems and collaboration tools.

### 7. Testing, Debugging, and Deployment:

- Testing web pages for cross-browser compatibility and responsiveness.
- Using browser developer tools for debugging and troubleshooting.
- Preparing web pages for deployment and publishing.
- Hosting and maintaining static websites.

### 8. Project Work:

- Applying the learned concepts and skills to create a complete static website.
- Incorporating responsive design, optimized graphics, and accessibility features.

	<ul style="list-style-type: none"> <li>Testing, debugging, and refining the website based on feedback and evaluation.</li> </ul>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	Employing these strategies can create a comprehensive and engaging learning experience in a web programming module, such as lectures, interactive discussions, hands-on lab sessions, case studies, assignments, projects, guest lectures, online resources, assessments, group projects, and continuous support.

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
<b>Structured SWL (hr/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	75	<b>Structured SWL (hr/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (hr/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	<b>Unstructured SWL (hr/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (hr/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>Quizzes</b>	2	10% (10)	5 and 10	#1, #2 and #3

Formative assessment	Assignments	2	10% (10)	2 and 12	#3, #4 and #6
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	#5, #6
Summative assessment	Midterm Exam	2hr	10% (10)	7	#1 - #4
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	Material Covered
Week 1	<b>Introduction to Static Web Design:</b> <ul style="list-style-type: none"> <li>• Overview of static web design and its role in website development.</li> <li>• Understanding the differences between static and dynamic websites.</li> <li>• Exploring the benefits and limitations of static web design.</li> </ul>
Week 2	<b>HTML Fundamentals:</b> <ul style="list-style-type: none"> <li>• Introduction to HTML markup and its structure.</li> <li>• Understanding HTML tags, elements, and attributes.</li> <li>• Creating and formatting text, headings, paragraphs, and lists.</li> </ul>
Week 3	<b>HTML Fundamentals:</b> <ul style="list-style-type: none"> <li>• Working with links, images, and multimedia content.</li> <li>• Creating tables for data representation.</li> </ul>
Week 4	<b>CSS Basics:</b> <ul style="list-style-type: none"> <li>• Introduction to CSS and its role in styling web pages.</li> <li>• Understanding CSS syntax, selectors, and properties.</li> <li>• Applying colors, backgrounds, and borders to elements.</li> </ul>
Week 5	<b>CSS Basics:</b> <ul style="list-style-type: none"> <li>• Controlling typography and font styles.</li> </ul>

	<ul style="list-style-type: none"> <li>Managing spacing and layout using margins, padding, and the box model.</li> </ul>
<b>Week 6</b>	<p><b>Layout and Responsive Design:</b></p> <ul style="list-style-type: none"> <li>Creating multi-column layouts using CSS.</li> <li>Understanding the concept of responsive web design.</li> <li>Using media queries to adapt layouts for different screen sizes.</li> </ul>
<b>Week 7</b>	<p><b>Layout and Responsive Design:</b></p> <ul style="list-style-type: none"> <li>Implementing flexible grids and fluid images.</li> <li>Applying responsive techniques to navigation menus and other elements.</li> </ul>
<b>Week 8</b>	<p><b>Web Graphics and Optimization:</b></p> <ul style="list-style-type: none"> <li>Optimizing images for web display, including compression techniques.</li> <li>Working with icon fonts and scalable vector graphics (SVG).</li> </ul>
<b>Week 9</b>	<p><b>Web Graphics and Optimization:</b></p> <ul style="list-style-type: none"> <li>Understanding the impact of file formats and sizes on page load times.</li> <li>Implementing techniques to improve web performance, such as caching and minification.</li> </ul>
<b>Week 10</b>	<p><b>Accessibility and Best Practices:</b></p> <ul style="list-style-type: none"> <li>Understanding the importance of web accessibility.</li> <li>Implementing accessibility features, such as alternative text for images and proper semantic markup.</li> </ul>
<b>Week 11</b>	<p><b>Accessibility and Best Practices:</b></p> <ul style="list-style-type: none"> <li>Following best practices for clean and maintainable code.</li> <li>Introduction to version control systems and collaboration tools.</li> </ul>
<b>Week 12</b>	<p><b>Testing, Debugging, and Deployment:</b></p> <ul style="list-style-type: none"> <li>Testing web pages for cross-browser compatibility and responsiveness.</li> <li>Using browser developer tools for debugging and troubleshooting.</li> </ul>

<b>Week 13</b>	<p><b>Testing, Debugging, and Deployment:</b></p> <ul style="list-style-type: none"> <li>• Preparing web pages for deployment and publishing.</li> <li>• Hosting and maintaining static websites.</li> </ul>
<b>Week 14</b>	<p><b>Project Work:</b></p> <ul style="list-style-type: none"> <li>• Applying the learned concepts and skills to create a complete static website.</li> <li>• Incorporating responsive design, optimized graphics, and accessibility features.</li> </ul>
<b>Week 15</b>	<p><b>Project Work:</b></p> <ul style="list-style-type: none"> <li>• Testing, debugging, and refining the website based on feedback and evaluation.</li> </ul>
<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>	<p>Lab 1: Introduction to HTML</p> <ul style="list-style-type: none"> <li>• Setting up the development environment</li> <li>• Creating the basic structure of an HTML document</li> <li>• Working with text, headings, and paragraphs</li> <li>• Creating lists and adding images</li> </ul>
<b>Week 2</b>	<p>Lab 2: HTML Advanced Concepts</p> <ul style="list-style-type: none"> <li>• Creating hyperlinks and navigation menus</li> <li>• Formatting tables for data representation</li> <li>• Embedding multimedia content (audio, video)</li> <li>• Introduction to forms and form elements</li> </ul>
<b>Week 3</b>	<p>Lab 3: CSS Basics</p> <ul style="list-style-type: none"> <li>• Introduction to CSS and linking stylesheets</li> <li>• Applying colors, backgrounds, and borders</li> </ul>

<b>Week 4</b>	<p>Lab 4: CSS Basics</p> <ul style="list-style-type: none"> <li>• Controlling typography and fonts</li> <li>• Managing spacing and layout using margins, padding, and the box model</li> </ul>
<b>Week 5</b>	<p>Lab 5: CSS Layouts and Positioning</p> <ul style="list-style-type: none"> <li>• Creating multi-column layouts</li> <li>• Implementing float and clear properties</li> </ul>
<b>Week 6</b>	<p>Lab 6: CSS Layouts and Positioning</p> <ul style="list-style-type: none"> <li>• Using flexbox for flexible layouts</li> <li>• Positioning elements (relative, absolute, fixed)</li> </ul>
<b>Week 7</b>	<p>Lab 7: Responsive Web Design</p> <ul style="list-style-type: none"> <li>• Understanding responsive design principles</li> <li>• Using media queries for different screen sizes</li> </ul>
<b>Week 8</b>	<p>Lab 8: Responsive Web Design</p> <ul style="list-style-type: none"> <li>• Creating flexible grids and fluid images</li> <li>• Designing responsive navigation menus</li> </ul>
<b>Week 9</b>	<p>Lab 9: Web Graphics and Optimization</p> <ul style="list-style-type: none"> <li>• Optimizing images for the web (compression, formats)</li> <li>• Working with icon fonts and scalable vector graphics (SVG)</li> </ul>
<b>Week 10</b>	<p>Lab 10: Web Graphics and Optimization</p> <ul style="list-style-type: none"> <li>• Implementing performance optimization techniques</li> <li>• Caching and minification of web assets</li> </ul>
<b>Week 11</b>	<p>Lab 11: Accessibility and Best Practices</p> <ul style="list-style-type: none"> <li>• Introduction to web accessibility guidelines</li> <li>• Implementing accessibility features (alternative text, semantic markup)</li> </ul>
<b>Week 12</b>	<p>Lab 12: Accessibility and Best Practices</p> <ul style="list-style-type: none"> <li>• Following best practices for clean and maintainable code</li> <li>• Version control and collaboration using Git</li> </ul>
<b>Week 13</b>	<p>Lab 8: Testing, Debugging, and Deployment</p> <ul style="list-style-type: none"> <li>• Testing web pages for cross-browser compatibility</li> <li>• Using browser developer tools for debugging and troubleshooting</li> <li>• Preparing web pages for deployment and publishing</li> <li>• Hosting and maintaining static websites</li> </ul>

<b>Week14</b>	Lab Project: Complete Static Website Development <ul style="list-style-type: none"> <li>Applying the learned concepts and skills to create a full static website</li> <li>Incorporating responsive design, optimized graphics, and accessibility features</li> <li>Testing, debugging, and refining the website based on feedback and evaluation</li> <li>Documentation and final deployment of the website</li> </ul>
<b>Week15</b>	<ul style="list-style-type: none"> <li>Final Exam</li> </ul>

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	<b>Textbook:</b> <ol style="list-style-type: none"> <li>"Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics" by Jennifer Niederst Robbins, 5th edition, published in October 2018.</li> <li>"HTML and CSS: Design and Build Websites" by Jon Duckett, 2th edition , published in November 2014.</li> </ol>	Yes (E-copy)
<b>Recommended Texts</b>	"HTML and CSS: Visual QuickStart Guide" by Elizabeth Castro and Bruce Hyslop, 8th edition, published in September 2013.	Yes (E-copy)
<b>Websites</b>	<a href="https://www.w3schools.com/html/">https://www.w3schools.com/html/</a> , <a href="https://www.w3schools.com/css/default.asp">https://www.w3schools.com/css/default.asp</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

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**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	<b>Artificial Intelligence 1</b>		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			
ECTS Credits	7		
SWL (hr/sem)	<b>175</b>		
Module Level	3	Semester of Delivery	
Administering Department	Computer Science	College	Computer Science and Information Tech.
Module Leader	Imad Shalaan Alshawi	e-mail	emad.alshawi@uobasrah.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date		Version Number	1.0

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes, and Indicative Contents

<b>Module Aims</b>	This course is an introductory survey of artificial intelligence. The course will cover the history, theory, and computational methods of artificial intelligence. Basic concepts include Logic, Theorem-Proving, knowledge representation and reasoning, AI search techniques, and Problems Solving. One or two application areas will be studied, selected from expert systems, robotics, computer vision, natural language understanding, and planning.
<b>Module Learning Outcomes</b>	<p>Provide the student with key vocabulary and help to understand artificial intelligence and expert systems by:</p> <ul style="list-style-type: none"> <li>• Understand artificial intelligence and expert systems and apply their basic concepts.</li> <li>• Realizing the importance of artificial intelligence and expert systems in practical life</li> <li>• Developing the concepts of artificial intelligence and expert systems and trying to reach new concepts.</li> </ul>
<b>Indicative Contents</b>	<p>Indicative content includes the following.</p> <p><u>Theoretical direction</u></p> <p>Explain the foundations of Artificial intelligence (AI). Where AI represents the behavior of specific characteristics of the program that make it simulate human mental capabilities and work patterns. Among the most important characteristics is the ability to learn, reason, and react to a situation that is not programmed into the machine.. [6 hrs]</p> <p>Knowledge representation: To create programs with "intelligent" qualities, developing techniques for representing knowledge is necessary. Unlike people, computers cannot acquire knowledge on their own. The AI programs use knowledge structures to describe objects, facts, rules, relationships, and procedures. The primary function of the knowledge structure is to provide the needed expertise and information so that a program can operate intelligently. Knowledge structures usually comprise traditional data structures and other complex structures such as Logical frames, scripts, semantic networks, conceptual graphs, and ATN(augment transition network. [9 hrs]</p> <p>Automatic Theorem Proving: It's called the Resolution technique for theorem proving in propositional and predicate calculus, which attempts to show that the statement's negation contradicts the general ideas. [12 hrs]</p> <p>Intelligent Search Methods and Strategies search is inherent to the problem and methods of Artificial Intelligence (AI). This is because AI problems are intrinsically</p>

	<p>complex. Efforts to solve problems with computers which humans can routinely innate cognitive abilities, pattern recognition, perception, and experience, invariably must turn to considerations of search. All search methods essentially fall into one of two categories, exhaustive (blind) methods, and heuristic or informed methods. [12 hrs]</p> <p>Introduction to Expert Systems: understand the expert systems and how they can build their software to solve the applications. [9 hrs]</p> <p>Revision problem classes [6 hrs]</p> <p><u>Part B - Practical direction</u></p> <p>An Introduction to Python with Beginning Python Basics and Python Program Flow. [8 hrs]</p> <p>Functions&amp; Modules, Exceptions Handling, Exceptions Handling, and Classes in python. [8 hrs].</p> <p>Generators and iterators and Data Structures in Python. [12 hrs]</p> <p>Using Python in Automatic Theorem Proving, and in Intelligent Search Methods. [12 hrs]</p>
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<b>Learning and Teaching Strategies</b>	
<b>Strategies</b>	The primary strategy adopted in delivering this course is to encourage student participation in the exercises while simultaneously refining and expanding their skills in the artificial intelligence field. This will be achieved through classes and scientific laboratories.

<b>Student Workload (SWL)</b>			
<b>Structured SWL (h/sem)</b>	75	<b>Structured SWL (h/w)<sup>1</sup></b>	5
<b>Unstructured SWL (h/sem)</b>	100	<b>Unstructured SWL (h/w)<sup>1</sup></b>	6.5
<b>Total SWL (h/sem)</b>	175		

## Module Evaluation

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

	Material Covered
Week 1, 2	Foundations of Artificial Integument (AI) : <ul style="list-style-type: none"> <li>• An introductory survey of AI.</li> <li>• History, theory of AI.</li> <li>• Philosophy of Intelligent</li> <li>• AI properties</li> <li>• Targets of AI</li> <li>• Applications of AI</li> <li>• Characteristics of the languages of AI</li> <li>• AI problems</li> <li>• Intelligent measures</li> <li>• Why we are study AI</li> </ul>
Week 3-5	Knowledge Representation: <ul style="list-style-type: none"> <li>• Knowledge Base in AI</li> <li>• Knowledge representation schemes in AI</li> <li>• Logical representation</li> <li>• Procedural representation</li> <li>• Network representation</li> <li>• Structured representation</li> </ul>
Week 6 7	Automatic Theorem Proving <ul style="list-style-type: none"> <li>• What is the theorem proving</li> <li>• How can use theorem proving to prove the theorems.</li> </ul>
Week 8-12	Intelligent Search Methods and Strategies in AI <ul style="list-style-type: none"> <li>• State Space Search</li> <li>• General Problem Solving Approaches</li> <li>• Search Techniques</li> </ul>

	<ul style="list-style-type: none"> <li>• Blind Search</li> <li>• Heuristic Search</li> <li>• Solving of some real problems</li> </ul>
<b>Week 13-14</b>	<p>What are Expert Systems?</p> <ul style="list-style-type: none"> <li>• Characteristics of Expert Systems</li> <li>• Capabilities of Expert Systems</li> <li>• Components of Expert Systems</li> <li>• Knowledge Base</li> <li>• Inference Engine</li> <li>• Expert Systems Limitations</li> <li>• Applications of Expert System</li> </ul>
<b>Week 15</b>	The preparatory week before the final exam
<b>Delivery Plan (Weekly Lab. Syllabus)</b>	
	<b>Material Covered</b>
<b>Week 1</b>	<p>An Introduction to Python with Beginning Python Basics</p> <ul style="list-style-type: none"> <li>• What can Python do?</li> <li>• Why Python?</li> <li>• Good to know</li> <li>• Python Syntax compared to other programming languages</li> <li>• Python Install</li> <li>• The print statement</li> <li>• Comments</li> <li>• Python Data Structures &amp; Data Types</li> <li>• String Operations in Python</li> <li>• Simple Input &amp; Output</li> <li>• Simple Output Formatting</li> <li>• Operators in python</li> </ul>
<b>Week 2</b>	<p>Python Program Flow</p> <ul style="list-style-type: none"> <li>• Indentation</li> <li>• The If statement and its' related statement</li> <li>• An example with if and it's related statement</li> <li>• The while loop</li> <li>• The for loop</li> <li>• The range statement</li> <li>• Break &amp;Continue</li> <li>• Assert</li> <li>• Examples for looping</li> </ul>
<b>Week 3,4</b>	<p>Functions&amp; Modules</p> <ul style="list-style-type: none"> <li>• Create your own functions</li> <li>• Functions Parameters</li> <li>• Variable Arguments</li> <li>• Scope of a Function</li> <li>• Function Documentations</li> <li>• Lambda Functions&amp; map</li> <li>• n Exercise with functions</li> <li>• Create a Module</li> </ul>

	<ul style="list-style-type: none"> <li>• Standard Modules</li> </ul>
<b>Week 5</b>	<p>Exceptions Handling</p> <ul style="list-style-type: none"> <li>• Errors</li> <li>• Exception handling with try</li> <li>• handling Multiple Exceptions</li> <li>• Writing your own Exception</li> </ul>
<b>Week 6,7</b>	<p>Classes In Python</p> <ul style="list-style-type: none"> <li>• New Style Classes</li> <li>• Creating Classes</li> <li>• Instance Methods</li> <li>• Inheritance</li> <li>• Polymorphism</li> <li>• Exception Classes &amp; Custom Exceptions</li> </ul>
<b>Week 8,9</b>	<p>Generators and iterators and Data Structures</p> <ul style="list-style-type: none"> <li>• Iterators</li> <li>• Generators</li> <li>• The Functions any and all</li> <li>• With Statement</li> <li>• Data Compression</li> <li>• List Comprehensions</li> <li>• Nested List Comprehensions</li> <li>• Dictionary Comprehensions</li> <li>• Functions</li> <li>• Default Parameters</li> <li>• Variable Arguments</li> <li>• Specialized Sorts</li> </ul>
<b>Week 10,11</b>	Using Python in Automatic Theorem Proving
<b>Week 12,14</b>	Using Python in Intelligent Search Methods

Learning and Teaching Resources		
	Text	Available in the Library?
<b>Required Texts</b>	<ol style="list-style-type: none"> <li>1. Wolfgang Ertel (2011). Introduction to Artificial Intelligence. Springer-Verlag London.</li> <li>2. Stuart Russell, Peter Norvig (2010). Artificial Intelligence: A Modern Approach, 3rd Edition (Prentice Hall Series in Artificial Intelligence). 3rd ed. Pearson Education.</li> </ol>	Yes
<b>Recommended Texts</b>		No
<b>Websites</b>	<a href="https://collegedunia.com/courses/python/syllabus">https://collegedunia.com/courses/python/syllabus</a> <a href="https://www.udemy.com/course/core-python-3-and-oop-course-for-absolute-beginners/">https://www.udemy.com/course/core-python-3-and-oop-course-for-absolute-beginners/</a>	

Group	Grade	Marks (%)	Definition
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<b>Success Group (50 - 100)</b>	<b>A - Excellent</b>	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	80 - 89	Above average with some errors
	<b>C - Good</b>	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	50 - 59	Work meets minimum criteria
<b>Fail Group (0 – 49)</b>	<b>FX – Fail</b>	(45-49)	More work is required, but credit awarded
	<b>F – Fail</b>	(0-44)	A considerable amount of work required

## MODULE DESCRIPTION FORM

Module Information				
Module Title	<b>Computer Networking 1</b>		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				
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	3	Semester of Delivery		1
Administering Department	Computer Science	College	Computer Science and Information Tech.	
Module Leader	Imad Shalaan Alshawi		e-mail	emad.alshawi@uobasrah.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.	
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date			Version Number	1.0

Relation with other Modules				
Prerequisite module	None		Semester	
Co-requisites module	None		Semester	

## Module Aims, Learning Outcomes, and Indicative Contents

<b>Module Aims</b>	This course provides a technical and operational overview of digital computer networks, the foundation for all modern information systems and services.
<b>Module Learning Outcomes</b>	The student will learn about the major software and hardware technologies used on home and enterprise computer networks and the global Internet. The student will understand how information is in digital packets and transported across local networks and other global networks interconnecting over the Internet backbone.
<b>Indicative Contents</b>	<p>Indicative content includes the following.</p> <p><u>Theoretical direction</u></p> <p>Introduction: Data communications, classification of computer networks, computer network topologies, communication protocols, and standards, layered tasks, the OSI model and layers, TCP/IP protocol suite, addressing. [6 hrs]</p> <p>In Physical Layer: Data and signals, analog and digital, analog and digital signals, signals and communication, digital signals, transmission of digital signals, transmission impairments, data rate limits and transmission and performance, digital to digital conversion, , connecting devices: Hub, Switches, Repeaters, Bridges, Routers, Gateways and Routers. [9 hrs]</p> <p>In Data Link Layer: Error detection and correction: introduction, CRC and checksum, framing, flow and error control. [6 hrs]</p> <p>In Network Layer: Class full and classless addressing, internetworking, routing concepts, IP routing, routing table, routing components, routing algorithm types (Static V.S. Dynamic, Source routing V.S. Hop-by-hop, Centralize V.S. Distributed, and Distance vector V.S. Link state). [9 hrs]</p> <p>In Transport Layer: Process to process delivery, Protocols: UDP, TCP and SCTP, congestion control, quality of service. [6 hrs]</p> <p>In Application Layer Functionality and Protocols: How do the functions of the three upper OSI model layers provide network services to end-user applications?, How do the TCP/IP application layer protocols provide the services specified by the upper layers of the OSI model?, How do people use the application layer to communicate across the information network?, What are the functions of well-known TCP/IP applications, such as the World Wide Web and e-mail, and their related services (HTTP, DNS, DHCP, STMP/POP, and Telnet)?. [9 hrs]</p>

	<p>Revision problem classes [6 hrs]</p> <p><u>Part B - Practical direction</u></p> <p>Fundamentals Study of different types of Network cables and practically implements the cross-wired cables and straight-through cables using a clamping tool. [8 hrs]</p> <p>Study of network addressing and How to connect the computers to LAN. [8 hrs]</p> <p>Introduction to packet tracer program [8 hrs]</p> <p>Learn how basic switch and router configuration. Also, Learn router configuration in small network. [15 hrs]</p>
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### Learning and Teaching Strategies

<b>Strategies</b>	<p>The primary strategy that will be adopted in delivering this course is to encourage student's participation in the exercises while simultaneously refining and expanding their skills in the networking field. This will be achieved through classes and scientific laboratories. In addition to exploring the capabilities and limitations of today's most popular networks, including Ethernet, Wi-Fi, and Cellular, it also covers topics closely related to networks.</p>
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### Student Workload (SWL)

<b>Structured SWL (h/sem)</b>	75	<b>Structured SWL (h/w)<sup>1</sup></b>	5
<b>Unstructured SWL (h/sem)</b>	75	<b>Unstructured SWL (h/w)<sup>1</sup></b>	5
<b>Total SWL (h/sem)</b>	150		

### Module Evaluation

		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>Midterm Exam</b>	2 hr	10% (10)	7	LO # 1-7

<b>Summative assessment</b>	<b>Final Exam</b>	2hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

	<b>Material Covered</b>
<b>Week 1, 2</b>	Introduction: Data communications, classification of computer networks, computer network topologies, communication protocols, and standards, layered tasks, the OSI model and layers, TCP/IP protocol suite, addressing.
<b>Week 3-5</b>	Physical Layer: Data and signals, analog and digital, analog and digital signals, signals and communication, digital signals, transmission of digital signals, transmission impairments, data rate limits and transmission and performance, digital to digital conversion, , connecting devices: Hub, Switches, Repeaters, Bridges, Routers, Gateways and Routers.
<b>Week 6</b>	Data Link Layer: Error detection and correction: introduction, CRC and checksum, framing, flow and error control.
<b>Week 7-9</b>	Network Layer: Class full and classless addressing, internetworking, routing concepts, IP routing, routing table, routing components, routing algorithm types (Static V.S. Dynamic, Source routing V.S. Hop-by-hop, Centralize V.S. Distributed, and Distance vector V.S. Link state).
<b>Week 10-11</b>	Transport Layer: Process to process delivery, Protocols: UDP, TCP and SCTP, congestion control, quality of service.
<b>Week 12-14</b>	Application Layer Functionality and Protocols: How do the functions of the three upper OSI model layers provide network services to end-user applications?, How do the TCP/IP application layer protocols provide the services specified by the upper layers of the OSI model?, How do people use the application layer to communicate across the information network?, What are the functions of well-known TCP/IP applications, such as the World Wide Web and e-mail, and their related services (HTTP, DNS, DHCP, STMP/POP, and Telnet)?.
<b>Week 15</b>	The preparatory week before the final exam

### Delivery Plan (Weekly Lab. Syllabus)

	Material Covered
Week 1,2	Lab 1: Study of different types of Network cables and practically implement the cross-wired cables and straight-through cables using a clamping tool
Week 3,4	Lab 2: Study of network devices in detail.
Week 5,6	Lab 3: Study of network addressing
Week 7,8	Lab 4: Connect the computers to LAN.
Week 9,10	Lab 5: Introduction to packet tracer program.
Week 11,12	Lab 6: Basic switch & router configuration
Week 13,14	Lab 7: Router configuration in small network

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	3. Behrouz Forouzan, "Introduction to Data Communication and Networking", Tata McGraw Hill, New Delhi. 4. Mark A. Dye, Rick McDonald, Antoon W. Ruff, "Network Fundamentals, CCNA Exploration Companion Guide", Copyright© 2008 Cisco Systems, Inc.	Yes
Recommended Texts	Nagpal D P, "Local Area Networks", Asian Books P Ltd, New Delhi	No
Websites	<a href="https://www.netacad.com/courses/networking">https://www.netacad.com/courses/networking</a>	

Group	Grade	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	90 - 100	Outstanding Performance
	B - Very Good	80 - 89	Above average with some errors
	C - Good	70 - 79	Sound work with notable errors
	D - Satisfactory	60 - 69	Fair but with major shortcomings
	E - Sufficient	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	(45-49)	More work is required, but credit awarded
	F – Fail	(0-44)	A considerable amount of work required

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Compiler Construction</b>		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	<b>CS308</b>		
ECTS Credits	6		
SWL (hr/sem)	<b>150</b>		
Module Level	1	Semester of Delivery	
Administering Department	CS	College	CSIT
Module Leader	Dr. Adalla M,ahdi Chyaid	e-mail	E-mail
Module Leader's Acad. Title	Assist. Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

### Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	CS208	
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- To understand and explain the main techniques and algorithms used in compilers.</p> <p>2- To understand, design and implement a lexical analyzer.</p> <p>3- To understand, design and implement a Syntax Analysis.</p> <p>4- To understand, design and implement a parser.</p> <p>5- To understand, design code generation schemes.</p>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>1- Learn about compilers and interpreters.</p> <p>2- Explain the main techniques and algorithms used in compilers.</p> <p>3- Describe an application of regular expressions in lexical scanners.</p> <p>4- Discuss the hand coded scanner and automatically generated a scanner.</p> <p>5- Explain the formal definition of tokens.</p> <p>6- Describe finite state automata.</p> <p>7- Explain the revision of formal definition of grammars.</p> <p>8- Explain BNF and EBNF.</p> <p>9- Describe the Bottom – up and top – down parsing.</p> <p>10- Explain tabular, recursive, and descent parsers.</p> <p>11- Learn about error handling.</p> <p>12- Describe the automatic generation of tabular parsers, symbol table. management, and the use of tools in support of the translation process.</p>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p>1- Introduction to Compilers: The role of language translation in the programming process;</p> <p>2- Comparison of interpreters and compilers, language translation phases, machine dependent and machine independent aspects of translation, language translation as a software engineering activity</p> <p>3- Lexical Analysis: Application of regular expressions in lexical scanners, hand coded scanner vs. automatically generated a scanner, formal definition of tokens</p>

	<p>4- Implementation of finite state automata.</p> <p>5- Syntax Analysis: Revision of formal definition of grammars, BNF and EBNF, Bottom – up, top – down parsing, ...</p> <p>6- Parsers Implementation: automatic generation of tabular parsers, symbol table management, the use of tools in support of the translation process,</p> <p>7- Project presentation1</p>
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### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

<b>Strategies</b>	Employing these strategies can create a comprehensive and engaging learning experience in compiler construction module, such as lectures, interactive discussions, hands-on lab sessions, case studies, assignments, projects, guest lectures, online resources, assessments, group projects, and continuous support.
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### Student Workload (SWL)

#### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	77	<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	73	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	6
<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,#3,#4, #11 and #11
	<b>Assignments</b>	2	10% (10)	2, 12	LO #5,#7, and #8, #10

	<b>Projects / Lab.</b>	1	10% (10)	Continuous	All
	<b>Report</b>	1	10% (10)	13	LO # 6,#7, #8,#9
<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+2</b>	Introduction to Compilers: The role of language translation in the programming process;
<b>Week 3+4</b>	Comparison of interpreters and compilers, language translation phases, machine dependent and machine independent aspects of translation, language translation as a software engineering activity
<b>Week 5</b>	Lexical Analysis: Application of regular expressions in lexical scanners,
<b>Week 6</b>	Lexical Analysis: hand coded scanner vs. automatically generated a scanners
<b>Week 7</b>	Lexical Analysis: formal definition of tokens
<b>Week 8</b>	Implementation of finite state automata.
<b>Week 9</b>	Syntax Analysis: Revision of formal definition of grammars,
<b>Week 10</b>	Syntax Analysis: BNF and EBNF;
<b>Week 11</b>	Syntax Analysis: Bottom up vs. top down parsing,
<b>Week 12</b>	Syntax Analysis: tabular vs. recursive descent parsers,
<b>Week 13</b>	error handling,
<b>Week 14</b>	Parsers Implementation: automatic generation of tabular parsers, symbol table management, the use of tools in support of the translation process,
<b>Week 15</b>	Project presentation

### Delivery Plan (Weekly Lab. Syllabus)

#### المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1+2</b>	Implementation of strings

<b>Week 3+4+5</b>	Implementation of regular expression and Finite state automata
<b>Week 6+7+8</b>	Implementation of a lexical analyzer
<b>Week 9+10</b>	Implementation of a symbol table
<b>Week 11+12+13</b>	Implementation of a basic parser (3 weeks)
<b>Week 14+15</b>	Design of a compiler for simple language (project)

### 00Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Aho, Alfred V. <i>Compilers: Principles, Techniques and Tools (for Anna University)</i> , 2/e. Pearson Education India, 2007.	
<b>Recommended Texts</b>	W. Appel, <i>Modern Compiler Implementation in Java</i> , Prentice Hall, 2002	
<b>Websites</b>		

### Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 – 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Software Engineering</b>		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			
ECTS Credits	6		
SWL (hr/sem)	<b>150(6*25)</b>		
Module Level	3	Semester of Delivery	
Administering Department	CS	College	CSIT
Module Leader	<b>DR.Zainab N.Nemer</b>		e-mail
Module Leader's Acad. Title	Assist prof.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
<b>Module Aims</b> أهداف المادة الدراسية	13. To develop problem solving skills and understanding techniques of teams. 14. This course deals with the basic concept of software engineering. 15. This is the basic subject for requirements, development and all SDLC. 16. To understand unified modeling language UML. 17. To understand management activities in software.
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	29. How to apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment. 30. An ability to work in one or more significant application domains 31. Work as an individual and as part of a multidisciplinary team to develop and deliver quality software. 32. Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle. 33. Demonstrate an ability to use the techniques and tools necessary for engineering practice. 34. Construct software project to apply the knowledge. 35. The students study planning and design of software including development processes, life-cycle models, quality issues, requirements analysis, design techniques, testing, and project management.
<b>Indicative Contents</b> المحتويات الإرشادية	Indicative content includes the following.  <u>Part A - introduction</u>

	<p>General introductory courses in software engineering the first part have been designed explicitly to support a one-semester course in introductory software engineering Define software, software system, software engineering, products, project, what are the differences between computer science and software engineering [8 hrs.]</p> <p>Professional software development, Software engineering ethics, Case studies. [7 hrs]</p> <p>Agile software development, Agile methods, Plan-driven and agile development, Extreme programming, Agile project management, Scaling agile methods [15 hrs]</p> <p>Requirements engineering, Functional and non-functional requirements, The software requirements document, Requirements specification, Requirements engineering processes, Requirements elicitation and analysis, Requirements validation, Requirements management [15 hrs]</p> <p><u>Part B -</u></p> <p>System modeling, Context models, Interaction models, Structural models, Behavioral models, Model-driven engineering. [8hrs]</p> <p>Project planning, Software pricing, Plan-driven development, Project scheduling, Agile planning, Estimation techniques. [7 hrs]</p>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.</p>

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> <b>((2lectur+2lab)*15weeks)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	60	<b>Structured SWL (h/w)</b> <b>(60\15 week)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	4
<b>Unstructured SWL (h/sem)</b> <b>(150-60)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	90	<b>Unstructured SWL (h/w)</b> <b>(90\15 week)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	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>	Team working

<b>Week 2</b>	Software project planning
<b>Week 3</b>	Software Methods
<b>Week 4</b>	Software Requirements Gathering
<b>Week 5</b>	Functional Modeling: Use Cases and Activity Diagrams
<b>Week 6</b>	Structural Modeling: domain modeling
<b>Week 7</b>	Structural Modeling: system classes
<b>Week 8</b>	First exam
<b>Week 9</b>	Behavioral modeling
<b>Week 10</b>	Introduction to User Interface Design
<b>Week 11</b>	System Design: Software design based on GRASP principles
<b>Week 12</b>	System Design: Software System Architecture
<b>Week 13</b>	System Implementation: Verification and validation of software systems
<b>Week 14</b>	System Implementation: tools
<b>Week 15</b>	Second 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: Introduction to java
<b>Week 2</b>	Lab 2: design interface in java
<b>Week 3</b>	Lab 3: build database in java
<b>Week 4</b>	Lab 4: suggest a project to work on it throw the latest weeks
<b>Week 5</b>	Lab 5: implement software activities on the project
<b>Week 6</b>	Lab 6: implement software activities on the project
<b>Week 7</b>	Lab 7: test the project

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	SOFTWARE ENGINEERING Ninth Edition Ian Sommerville	no
<b>Recommended Texts</b>	-	
<b>Websites</b>	- <a href="http://www.SoftwareEngineering-9.com">http://www.SoftwareEngineering-9.com</a>	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 – 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Operations Research</b>		Module Delivery
Module Type	<b>Core</b>		<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	<b>UoB12345</b>		
ECTS Credits	<b>8</b>		
SWL (hr/sem)	<b>200</b>		
Module Level	3	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Name	e-mail	Nasir.jasim@uobasrah.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
<b>Module Objectives</b> أهداف المادة الدراسية	<ol style="list-style-type: none"> <li>1. Modeling realistic problems with different mathematical formulas.</li> <li>2. Finding a solution to any problem available in the labor market after modeling it using different methods of solution.</li> <li>3. Searching for the best solution to the problem and searching for the best method used to deliver the product to the labor market.</li> </ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<p><b>Cognitive goals</b></p> <ol style="list-style-type: none"> <li>1. Enable the student to identify problems in the labor market.</li> <li>2. The student's ability to model realistic problems.</li> <li>3. Enabling the student to solve any problem he encounters in the labor market by converting it into a mathematical model and solving it in one of the solutions.</li> </ol> <p><b>Skill objectives for the course</b></p> <ol style="list-style-type: none"> <li>1. Work as a member of a team to solve any problem in the market.</li> <li>2. Understanding mathematics through practice</li> </ol>
<b>Indicative Contents</b> المحتويات الإرشادية	Indicative content includes the following.  Part A – Linear Programming

	<p>Constructing Linear Programming Models, Forms of Linear programming model, The formulation of linear programming Model, Method of solution of Linear programming Model. [8hrs]</p> <p>Part B - Method of solution of Linear programming Model</p> <p>Graphical method , Simplex Method. [8 hrs]</p> <p>Part C - Artificial Variable Technique, Duality in Linear Programming</p> <p>Two Phase Method, Duality and simplex method [9 hrs]</p> <p>Part D – Transportation Problems</p> <p>Method for Initial Basic Feasible Solution to a transportation problems, North-West Corner Rule, Least Cost Method, Vogel's Approximation Method,</p> <p>Testing initial basic feasible solution and obtain by it the optimal solution, Stepping Stone Method, Modified Distribution method. [10 hrs]</p> <p>Part E – Assignment Problems [6 hrs]</p>
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<p style="text-align: center;"><b>Learning and Teaching Strategies</b></p> <p style="text-align: center;">استراتيجيات التعلم والتعليم</p>	
<b>Strategies</b>	<p>Providing distinguished educational and research services that keep pace with local and international quality standards in the fields of computer and informatics. These services allow preparing a distinguished, competitive graduate. In addition to that, the completion of high-end scientific research and effective participation in community service and building a knowledge-based economy.</p>

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<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	<b>200</b>		

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

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction – Linear programming Models, Forms of Linear programming Models
Week 2	Application Examples , Graphical Methods for Solving Linear Programming Models
Week 3	Simplex Method
Week 4	Solving Linear Programming Problems by Simplex Method
Week 5	Artificial Variable Technique
Week 6	Duality in Linear Programming Problem
Week 7	Duality and Simplex Method
Week 8	Assignment 1
Week 9	Transportation Problems
Week 10	Initial Basic Feasible Solution of Transportation problems
Week 11	Optimal Solution of Linear Programming Problems
Week 12	Unbalanced Transportation Problem
Week 13	Assignment 2
Week 14	Assignment Problems
Week 15	The Hungarian Method for Assignment Problem
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	Makebest Decisions Through Operations Research, S.D.SHARMA	Yes
Recommended Texts	Prem Kumar Gupta, D.S. HIRA, S.CHAND بحوث العمليات (مفهوما وتطبيقا) تأليف الدكتور حامد سعد نور الشمري	Yes
Websites		

### Grading Scheme

#### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

## MODULE DESCRIPTION FORM

Module Information			
Module Title	<b>Artificial Intelligence 2</b>		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			
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	3	Semester of Delivery	
Administering Department	Computer Science	College	Computer Science and Information Tech.
Module Leader	Imad Shalaan Alshawi	e-mail	emad.alshawi@uobasrah.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date		Version Number	1.0

Relation with other Modules			
Prerequisite module	Artificial Intelligence 1	Semester	1
Co-requisites module	None	Semester	

## Module Aims, Learning Outcomes, and Indicative Contents

<b>Module Aims</b>	The course is a research-based course and therefore focuses on leading students to investigate the current state of research in Computational Intelligent areas as well as to gain comprehensive theoretical knowledge from scientific research about the basic concepts and features of CI methodologies and approaches.
<b>Module Learning Outcomes</b>	<p>Provide the student with key vocabulary and help to understand artificial intelligence and Computational intelligence by understand:</p> <ul style="list-style-type: none"> <li>• Optimization <ul style="list-style-type: none"> <li>○ Constrained, unconstrained optimization</li> <li>○ Parameter space, function space, and fitness space</li> <li>○ Local and global optima</li> <li>○ Multi-objective optimization</li> </ul> </li> <li>• Classification / Learning <ul style="list-style-type: none"> <li>○ Classification (Supervised Learning)</li> <li>○ Clustering (Unsupervised Learning)</li> <li>○ Reinforcement Learning</li> </ul> </li> <li>• Control Systems</li> </ul>
<b>Indicative Contents</b>	<p>Indicative content includes the following.</p> <p><u>Theoretical direction</u></p> <p>Introduction to Computational Intelligent topics fundamental concepts. [6 hrs]</p> <p>Neural Networks (NNs): A neural network is a method in artificial intelligence that teaches computers to process data in a way that is inspired by the human brain. It is a type of machine learning process, called deep learning that uses interconnected nodes or neurons in a layered structure that resembles the human brain. [9 hrs]</p> <p>Fuzzy Logic (FL): Fuzzy logic is a form of many-valued logic in which the truth value of variables may be any actual number between 0 and 1. It is employed to handle the concept of partial truth, where the truth value may range between entirely true and false. By contrast, in Boolean logic, the truth values of variables may only be the integer values 0 or 1. [9 hrs]</p> <p>Genetic Algorithms (GAs): In computer science and operations research, a genetic algorithm (GA) is a meta-heuristic inspired by the process of natural selection that belongs to the larger class of evolutionary algorithms (EA). Genetic algorithms are commonly used to generate high-quality solutions to optimization and search problems by relying on biologically inspired operators such as mutation, crossover, and selection. Some examples of GA applications include optimizing decision trees for</p>

	<p>better performance, solving Sudoku puzzles, hyper-parameter optimization, causal inference, etc.. [9 hrs]</p> <p>Swarm Intelligence: Swarm intelligence (SI) is the collective behavior of decentralized, self-organized, natural, or artificial systems. The concept is employed in work on artificial intelligence. SI systems typically consist of a population of simple agents or boids interacting locally with one another and with their environment. The inspiration often comes from nature, especially biological systems. The agents follow straightforward rules, and although there is no centralized control structure dictating how individual agents should behave, local and to a certain degree, random interactions between such agents lead to the emergence of "intelligent" global behavior unknown to the individual agents. Examples of swarm intelligence in natural systems include ant colonies, bee colonies, bird flocking, hawks hunting, animal herding, bacterial growth, fish schooling, and microbial intelligence. [9 hrs]</p> <p>Revision problem classes [6 hrs]</p> <p><u>Part B - Practical direction by Python</u></p> <p>Introduction to Python for AI . [6 hrs]</p> <p>Applying python of same of NN applications. [9 hrs].</p> <p>Applying python of same of Fuzzy applications. [9 hrs]</p> <p>Applying python of same of GAs applications. [9 hrs]</p> <p>Applying python of same of Swarm Intelligent applications. [9 hrs]</p> <p>Applying python of same of Hybridization of CI Algorithms applications. [6 hrs]</p>
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<b>Learning and Teaching Strategies</b>	
<b>Strategies</b>	The primary strategy adopted in delivering this course is to encourage student participation in the exercises while simultaneously refining and expanding their skills in the artificial intelligence field. This will be achieved through classes and scientific laboratories.

### Student Workload (SWL)

Structured SWL (h/sem)	75	Structured SWL (h/w) <sup>1</sup>	5
Unstructured SWL (h/sem)	100	Unstructured SWL (h/w) <sup>1</sup>	6.5
<b>Total SWL (h/sem)</b>	175		

### Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	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
<b>Total assessment</b>			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

	Material Covered
<b>Week 1</b>	Introduction to Computational Intelligent topics fundamental concepts.
<b>Week 2, 4</b>	Neural Networks (NNs) <ul style="list-style-type: none"> <li>• Introduction to NN</li> <li>• Supervised, and unsupervised learning,</li> <li>• NN training algorithms, training rules,</li> <li>• Back propagation algorithm</li> <li>• Applications of NNs.</li> </ul>
<b>Week 5-7</b>	Fuzzy Logic (FL) <ul style="list-style-type: none"> <li>• Introduction to FL</li> <li>• Classical and fuzzy sets: Overview of classical sets</li> <li>• Membership function</li> <li>• Fuzzy rule generation.</li> <li>• Operations on Fuzzy Sets: Compliment, Intersections, Unions, Combinations of Operations</li> <li>• Fuzzy Arithmetic, Linguistic Variables, Arithmetic Operations.</li> <li>• Applications of FL.</li> </ul>

<b>Week 8 10</b>	Genetic Algorithms (GAs) <ul style="list-style-type: none"> <li>• Introduction to GAs</li> <li>• Genetic Operators and Parameters</li> <li>• GAs in problem solving</li> <li>• Theoretical foundations of genetic algorithms, implementation issues.</li> <li>• Applications of GAs</li> </ul>
<b>Week 11-13</b>	Swarm Intelligence <ul style="list-style-type: none"> <li>• Particle Swarm Optimization (PSO).</li> <li>• Overview of Ant Colony Algorithm, and Bee Colony Algorithm.</li> </ul>
<b>Week 14</b>	Hybridization of CI Algorithms. <ul style="list-style-type: none"> <li>• Applications of Hybrid CI algorithms</li> </ul>
<b>Week 15</b>	The preparatory week before the final exam

### Delivery Plan (Weekly Lab. Syllabus)

	Material Covered
<b>Week 1</b>	Introduction to Python for AI
<b>Week 2-4</b>	Applying python of some of NN applications
<b>Week 5-7</b>	Applying python of some of Fuzzy applications
<b>Week 8-10</b>	Applying python of some of GAs applications
<b>Week 11-13</b>	Applying python of some of Swarm Intelligent applications
<b>Week 14,15</b>	Applying python of some of Hybridization of CI Algorithms applications

### Learning and Teaching Resources

	Text	Available in the Library?
<b>Required Texts</b>	5. James M. Keller et al., "Fundamentals of Computational Intelligence: Neural Networks, Fuzzy Systems, and Evolutionary Computation", Wiley-IEEE Press, 2016. 6. Jiangjun Tang et al. "Simulation and Computational Red Teaming for Problem Solving", ch12: Computational Intelligence, Wiley-IEEE Press, pp. 219 – 240, 2020. 7. Jan Peters, "Computational Intelligence: Principles, Techniques and Applications", Computer Journal, 2007. 8. Mircea Eremia et al., "Advanced Solutions in Power Systems: HVDC, FACTS, and Artificial Intelligence", ch17: Fuzzy Systems, Wiley-IEEE Press, pp. 785 - 818, 2016.	Yes
<b>Recommended Texts</b>		No
<b>Websites</b>		

Group	Grade	Marks (%)	Definition
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<b>Success Group (50 - 100)</b>	<b>A - Excellent</b>	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	80 - 89	Above average with some errors
	<b>C - Good</b>	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	50 - 59	Work meets minimum criteria
<b>Fail Group (0 – 49)</b>	<b>FX – Fail</b>	(45-49)	More work is required, but credit awarded
	<b>F – Fail</b>	(0-44)	A considerable amount of work required

## MODULE DESCRIPTION FORM

Module Information				
Module Title	<b>Computer Networking 2</b>		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				
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	3	Semester of Delivery		2
Administering Department	Computer Science	College	Computer Science and Information Tech.	
Module Leader	Imad Shalaan Alshawi		e-mail	emad.alshawi@uobasrah.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.	
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date			Version Number	1.0

Relation with other Modules				
Prerequisite module	Computer Networking 1		Semester	1
Co-requisites module	None		Semester	

## Module Aims, Learning Outcomes, and Indicative Contents

<b>Module Aims</b>	This course introduces the architecture, structure, functions, components, and models of the Internet and other computer networks. The principles and design of IP addressing and the fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for the curriculum..
<b>Module Learning Outcomes</b>	<p>At the end of the course, the students will be able to:</p> <ul style="list-style-type: none"> <li>• Understand and describe the devices and services used to support communications in data networks and the Internet</li> <li>• Understand and describe the role of protocol layers in data networks</li> <li>• Understand and describe the importance of addressing and naming schemes at various layers of data networks in IPv4 and IPv6 environments</li> <li>• Design, calculate, and apply subnet masks and addresses to fulfill given requirements in IPv4 and IPv6 networks</li> <li>• Explain fundamental Ethernet concepts, such as media, services, and operations</li> <li>• Build a simple Ethernet network using routers and switches</li> <li>• Use Cisco command-line interface (CLI) commands to perform basic router and switch configurations</li> <li>• Utilize standard network utilities to verify small network operations and analyze data traffic.</li> </ul>
<b>Indicative Contents</b>	<p>Indicative content includes the following.</p> <p>Introduction to explain how multiple networks are used in everyday life. Describe the topologies and devices used in a small to medium-sized business network. Explain the essential characteristics of a network that supports communication in a small to medium-sized business. Explain networking trends that will affect network use in small to medium-sized companies. [8 hrs]</p> <p>Explain the features and functions of Cisco IOS Software. Configure initial settings on a network device using the Cisco IOS software. Given an IP addressing scheme, configure IP address parameters on end devices to provide end-to-end connectivity in a small to medium-sized business network. [9 hrs]</p> <p>Explain how rules facilitate communication. Explain the role of protocols and standards organizations in facilitating interoperability in network communications. Explain how devices on LAN access resources in a small to medium-sized business network.. [8 hrs]</p> <p>Explain how physical layer protocols and services support communications across data networks. Build a simple network using the appropriate media. Explain the role of the data link layer in supporting communications across data networks. Compare media access control techniques and logical topologies used in networks. [9 hrs]</p>

	<p>Explain the operation of Ethernet. Explain how a switch operates. Explain how the address resolution protocol enables communication on a network. [6 hrs]</p> <p>Explain the use of IPv4 addresses to provide connectivity in small to medium-sized business networks. Configure IPv6 addresses to provide connectivity in small to medium-sized business networks. Use standard testing utilities to verify and test network connectivity. [9 hrs]</p> <p>Implement an IPv4 addressing scheme to enable end-to-end connectivity in a small to medium-sized business network. Given a set of requirements, implement a VLSM addressing plan to connect end users in a small to medium-sized network. Explain design considerations for implementing IPv6 in a business network. [6 hrs]</p> <p>Explain how transport layer protocols and services support communications across data networks. Compare the operations of transport layer protocols in supporting end-to-end communication. [8 hrs]</p> <p>Explain the operation of the application layer in providing support to end-user applications. Explain how well-known TCP/IP application layer protocols operate. [8 hrs]</p> <p>Explain the features and functions of Cisco IOS Software. Configure initial settings on a network device using the Cisco IOS software. Given an IP addressing scheme, configure IP address parameters on end devices to provide end-to-end connectivity in a small to medium-sized business network. [8 hrs]</p>
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**Learning and Teaching Strategies**

<b>Strategies</b>	<p>The primary strategy adopted in delivering this course is to encourage students' participation in the exercises while simultaneously refining and expanding their skills in the networking field. This will be achieved through classes and scientific laboratories. In addition to exploring the capabilities and limitations of today's most popular networks, including Ethernet, Wi-Fi, and cellular, it also covers topics closely related to networks.</p> <p>By the end of the course, students will be able to build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes.</p>
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Student Workload (SWL)			
Structured SWL (h/sem)	75	Structured SWL (h/w) <sup>1</sup>	5
Unstructured SWL (h/sem)	75	Unstructured SWL (h/w) <sup>1</sup>	5
Total SWL (h/sem)	150		

Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	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)	
	Material Covered
Week 1, 2	Explore the Network
Week 3-4	Configure a Network Operating System
Week 5,7	Network Protocols and Communications, and Network Access
Week 8	Ethernet
Week 9-11	Network Layer, IP Addressing, and Subnetting IP Networks
Week 12	Transport Layer
Week 13	Application Layer
Week 14	Build a Small Network
Week 15	The preparatory week before the final exam
Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	Lab 1: Packet Tracer Program

<b>Week 2</b>	Lab 2: Switch & Router Configuration.
<b>Week 3,4</b>	Lab 3: Router Configuration Networks
<b>Week 5,6</b>	Lab 4: Address Resolution Protocol ARP and Reverse Address Resolution Protocol RARP
<b>Week 7</b>	Lab 5: Domain Name Service (DNS)
<b>Week 8,9</b>	Lab 6: Dynamic Host Control Protocol (DHCP)
<b>Week 10</b>	Lab 7: Virtual Local Area Network (VLAN)
<b>Week 11,12</b>	Lab 8: Configure a Network using Distance Vector Routing protocol.
<b>Week 13,14</b>	Lab 9: Configure a Network using Link State Routing protocol

### Learning and Teaching Resources

	Text	Available in the Library?
<b>Required Texts</b>	9. Behrouz Forouzan, "Introduction to Data Communication and Networking", Tata McGraw Hill, New Delhi. 10. Mark A. Dye, Rick McDonald, Antoon W. Ruff, "Network Fundamentals, CCNA Exploration Companion Guide", Copyright© 2008 Cisco Systems, Inc.	Yes
<b>Recommended Texts</b>	Nagpal D P, "Local Area Networks", Asian Books P Ltd, New Delhi	No
<b>Websites</b>	<a href="https://www.netacad.com/courses/networking">https://www.netacad.com/courses/networking</a>	

Group	Grade	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> – Excellent	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	80 - 89	Above average with some errors
	<b>C</b> – Good	70 - 79	Sound work with notable errors
	<b>D</b> – Satisfactory	60 - 69	Fair but with major shortcomings
	<b>E</b> – Sufficient	50 - 59	Work meets minimum criteria
<b>Fail Group (0 – 49)</b>	<b>FX</b> – Fail	(45-49)	More work is required, but credit awarded
	<b>F</b> – Fail	(0-44)	A considerable amount of work required

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Visual Programming</b>		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	<b>CS303</b>		
ECTS Credits	6		
SWL (hr/sem)	<b>150</b>		
Module Level	3	Semester of Delivery	
Administering Department	Computer Science department	College	College of computer science and information technology
Module Leader	Name	e-mail	E-mail
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	/06/2023	Version Number	1.0

## Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

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

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	<p>18. Ability to demonstrate knowledge of interface design principles and be able to apply them in a visual programming environment.</p> <p>19. The student should have knowledge of Object Oriented Concepts and how to implement them in a visual programming environment.</p>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<p>A- Cognitive goals</p> <p>20. Transforming the vision and path of traditional programming concepts towards visual programming</p> <p>21. Expanding the student's knowledge from the idea of scattered small programs to an integrated application</p> <p>22. Expanding the student's knowledge of Object Oriented</p> <p>23. Expanding the student's knowledge towards programming the use of sound, images and video for presentation requirements</p> <p>B - The soft skills objectives of the course.</p> <ol style="list-style-type: none"> <li>1. Developing the student's skills in searching for ideas to present as proposals for discussion to implement simplified projects</li> <li>2. Developing the student's programming skills through implementing some of the ideas presented and discussed, such as:</li> <li>3. Programming some games or educational programs in a smooth and useful review manner.</li> </ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p>VB.Net is considered an event-driven language that is easy to learn and write code. It is designed to foster rapid application development (RAD), where the application prototype can be developed first with less focus on writing complex codes in the initial stages of the development cycle.</p>

	<p>In a course, you will build on existing knowledge of the design process to carry out a project, which will integrate elements of user interface, user experience and service design.</p> <p>In a course, introduced you to the basics of designing applications with Visual Studio 2012 and the components of the Visual Basic language. You know how to design graphical user interfaces (GUIs) and how to use Visual Basic statements to program events for the various controls. You also know how to write functions and subroutines and how to call the functions and subroutines that are built into Visual Basic.</p>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<p>Readings, self-learning, panel discussions.</p> <ul style="list-style-type: none"> <li>- Classroom exercises and activities.</li> <li>- Guiding students to some websites to benefit from them to develop abilities.</li> <li>- Holding research seminars through which some problems are explained and analyzed and the mechanism for finding solutions.</li> </ul> <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	75	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	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	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	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 visual programming
Week 2	Fundamental Object Types
Week 3	Fundamental Object Types
Week 4	Event-driven Programming
Week 5	Variables & Constants & Operators
Week 6	Control Structures
Week 7	Loops
Week 8	Input / Output Boxes
Week 9	Array
Week 10	Built in Functions
Week 11	Date and Time
Week 12	ListBox Control & ComboBox Control
Week 13	RadioButton Control & CheckBox Control
Week 14	Sub Functions
Week 15	Sub Procedures

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	Lab 1: Introduction on Environment
<b>Week 2</b>	Lab 2: Fundamental Object Types & Event
<b>Week 3</b>	Lab 3: Fundamental Object Types & Event
<b>Week 4</b>	Lab 4: Input / Output Boxes
<b>Week 5</b>	Lab 5: Built in Functions
<b>Week 6</b>	Lab 6: Date and Time
<b>Week 7</b>	Lab 7: ListBox Control
<b>Week 8</b>	Lab 8: ComboBox Control
<b>Week 9</b>	Lab 9: RadioButton Control
<b>Week 10</b>	Lab 10: CheckBox Control
<b>Week 11</b>	Lab 11: Control Structures
<b>Week 12</b>	Lab 12: Loops
<b>Week 13</b>	Lab 13: Array
<b>Week 14</b>	Lab 14: Sub Functions
<b>Week 15</b>	Lab 15: Sub Procedures

## Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Recommended Texts</b>	The Complete Reference Visual Basic .NET	
<b>Recommended Texts</b>	Programming Visual Basic .NET	
<b>Recommended Texts</b>	An Introduction to Programming Using Visual Basic 2012	

## 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	<b>Web Technologies</b>		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				
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	3	Semester of Delivery		2
Administering Department		College	CSIT	
Module Leader	Dr. Raad A. Muhajjar		e-mail	Raad.muhajjar@uobasrah.edu.iq
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail

<b>Scientific Committee Approval Date</b>	15/06/2023	<b>Version Number</b>	1.0
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### Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

<b>Prerequisite module</b>	Web Development	<b>Semester</b>	1
<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 Objectives</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> <li>8. Understanding PHP Basics: Learn the fundamentals of PHP programming language, including syntax, variables, data types, operators, control structures, and functions.</li> <li>9. Web Development Concepts: Gain an understanding of web development concepts such as client-server architecture, HTTP protocol, request/response cycle, and the role of PHP in web development.</li> <li>10. Working with HTML and CSS: Learn how to integrate PHP code within HTML and CSS to create dynamic web pages. Understand how to generate HTML content using PHP and manipulate CSS styles based on dynamic conditions.</li> <li>11. Handling Form Data: Explore techniques for handling form submissions using PHP. Learn how to retrieve form data, validate and sanitize input, and perform server-side form processing.</li> <li>12. Working with Databases: Understand the basics of database management systems and how to interact with databases using PHP. Learn how to establish database connections, execute SQL queries, and handle result sets.</li> <li>13. Session and Cookies Management: Explore techniques for managing user sessions and cookies using PHP. Learn how to create, store, and retrieve session data, as well as how to implement user authentication and authorization.</li> <li>14. File Handling: Gain knowledge on file handling operations in PHP, such as reading from and writing to files, uploading files, and manipulating file metadata.</li> <li>15. Working with APIs: Understand the concepts of Application Programming Interfaces (APIs) and learn how to interact with external APIs using PHP. Explore techniques for consuming and integrating data from popular APIs.</li> </ol>
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<p style="text-align: center;"><b>Module Learning Outcomes</b></p> <p style="text-align: center;">مخرجات التعلم للمادة الدراسية</p>	<p>When completing a web programming module focused on PHP, the student can gain the following learning outcomes:</p> <ol style="list-style-type: none"> <li>12. Basic PHP Knowledge: Demonstrate a solid understanding of PHP syntax, variables, data types, operators, control structures, and functions.</li> <li>13. Dynamic Web Page Creation: Develop the ability to integrate PHP code with HTML and CSS to create dynamic web pages that can generate and manipulate content based on user input or database interactions.</li> <li>14. Form Handling: Successfully handle form submissions using PHP by retrieving form data, validating and sanitizing input, and performing server-side form processing.</li> <li>15. Database Interaction: Exhibit competence in establishing connections with databases, executing SQL queries, handling result sets, and implementing basic database operations such as inserting, updating, and deleting data.</li> <li>16. Session and Cookies Management: Implement session and cookies management techniques in PHP to maintain user sessions, store user data, and implement basic user authentication and authorization functionalities.</li> <li>17. File Handling: Acquire skills in reading from and writing to files, uploading files, and manipulating file metadata using PHP.</li> <li>18. API Integration: Demonstrate the ability to consume data from external APIs, understand API documentation, and effectively integrate API functionality into PHP-based web applications.</li> </ol>
<p style="text-align: center;"><b>Indicative Contents</b></p> <p style="text-align: center;">المحتويات الإرشادية</p>	<ul style="list-style-type: none"> <li>• Introduction to PHP:       <ol style="list-style-type: none"> <li>a. PHP syntax and basic language constructs</li> <li>b. Variables, data types, and operators</li> <li>c. Control structures (conditionals, loops)</li> <li>d. Functions and procedural programming</li> </ol> </li> <li>• Web Development Basics:       <ol style="list-style-type: none"> <li>a. Client-server architecture and HTTP protocol</li> <li>b. Request/response cycle</li> <li>c. Introduction to HTML and CSS</li> <li>d. Integrating PHP with HTML and CSS</li> </ol> </li> <li>• Form Handling and Validation:       <ol style="list-style-type: none"> <li>a. Creating HTML forms</li> <li>b. Handling form submissions with PHP</li> <li>c. Validating and sanitizing user input</li> <li>d. Displaying form errors and feedback</li> </ol> </li> </ul>

	<ul style="list-style-type: none"> <li>• Database Interaction with PHP: <ul style="list-style-type: none"> <li>a. Introduction to relational databases (e.g., MySQL)</li> <li>b. Establishing database connections in PHP</li> <li>c. Executing SQL queries with PHP</li> <li>d. Handling result sets and retrieving data</li> </ul> </li> <li>• Session Management and Authentication: <ul style="list-style-type: none"> <li>a. Understanding sessions and cookies</li> <li>b. Managing user sessions in PHP</li> <li>c. Implementing user authentication and authorization</li> <li>d. Securing sensitive data and preventing session hijacking</li> </ul> </li> <li>• File Handling and Uploading: <ul style="list-style-type: none"> <li>a. Reading from and writing to files with PHP</li> <li>b. Handling file uploads and validating file types</li> <li>c. Manipulating file metadata (e.g., resizing images)</li> <li>d. File system operations and directory handling</li> </ul> </li> <li>• Working with APIs <ul style="list-style-type: none"> <li>a) Introduction to APIs and their usage in web development</li> <li>b) Making API requests with PHP</li> <li>c) Parsing and manipulating API responses (JSON, XML)</li> <li>d) Integrating data from popular APIs (e.g., Google Maps, Twitter)</li> </ul> </li> </ul>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	Employing these strategies can create a comprehensive and engaging learning experience in a web programming module, such as lectures, interactive discussions, hands-on lab sessions, case studies, assignments, projects, guest lectures, online resources, assessments, group projects, and continuous support.

### Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

<b>Structured SWL (hr/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	75	<b>Structured SWL (hr/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (hr/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	<b>Unstructured SWL (hr/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (hr/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	2	10% (10)	5 and 10	#1, #2 and #3
	Assignments	2	10% (10)	2 and 12	#3, #4 and #6
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	#5, #6
Summative assessment	Midterm Exam	2hr	10% (10)	7	#1 - #4
	Final Exam	3hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	<p><b>Introduction to PHP</b></p> <ul style="list-style-type: none"> <li>• PHP syntax and basic language constructs</li> <li>• Variables, data types, and operators</li> </ul>
Week 2	<p><b>Introduction to PHP</b></p> <ul style="list-style-type: none"> <li>• Control structures (conditionals, loops)</li> <li>• Functions and procedural programming</li> </ul>
Week 3	<p><b>Web Development Basics:</b></p> <ul style="list-style-type: none"> <li>• Client-server architecture and HTTP protocol</li> <li>• Request/response cycle</li> </ul>
Week 4	<p><b>Web Development Basics:</b></p> <ul style="list-style-type: none"> <li>• Introduction to HTML and CSS</li> <li>• Integrating PHP with HTML and CSS</li> </ul>
Week 5	<p><b>Form Handling and Validation:</b></p> <ul style="list-style-type: none"> <li>• Creating HTML forms</li> <li>• Handling form submissions with PHP</li> </ul>
Week 6	<p><b>Form Handling and Validation:</b></p> <ul style="list-style-type: none"> <li>• Validating and sanitizing user input</li> <li>• Displaying form errors and feedback</li> </ul>
Week 7	<p><b>Database Interaction with PHP:</b></p> <ul style="list-style-type: none"> <li>• Introduction to relational databases (e.g., MySQL)</li> <li>• Establishing database connections in PHP</li> </ul>
Week 8	<p><b>Database Interaction with PHP:</b></p> <ul style="list-style-type: none"> <li>• Executing SQL queries with PHP</li> <li>• Handling result sets and retrieving data</li> </ul>
Week 9	<p><b>Session Management and Authentication:</b></p> <ul style="list-style-type: none"> <li>• Understanding sessions and cookies</li> <li>• Managing user sessions in PHP</li> </ul>
Week 10	<p><b>Session Management and Authentication:</b></p> <ul style="list-style-type: none"> <li>• Implementing user authentication and authorization</li> <li>• Securing sensitive data and preventing session hijacking</li> </ul>

<b>Week 11</b>	<p><b>File Handling and Uploading:</b></p> <p>Reading from and writing to files with PHP</p> <p>Handling file uploads and validating file types</p>
<b>Week 12</b>	<p><b>File Handling and Uploading:</b></p> <p>Manipulating file metadata (e.g., resizing images)</p> <p>File system operations and directory handling</p>
<b>Week 13</b>	<p><b>Working with APIs</b></p> <ul style="list-style-type: none"> <li>• Introduction to APIs and their usage in web development</li> <li>• Making API requests with PHP</li> </ul>
<b>Week 14</b>	<p><b>Working with APIs</b></p> <ul style="list-style-type: none"> <li>• Parsing and manipulating API responses (JSON, XML)</li> <li>• Integrating data from popular APIs (e.g., Google Maps, Twitter)</li> </ul>
<b>Week 15</b>	<p><b>Project Presentations and Wrap-up</b></p> <ul style="list-style-type: none"> <li>• Group project presentations</li> <li>• Discussion and reflection on the course</li> </ul>
<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>	<ul style="list-style-type: none"> <li>• Setting up the development environment (XAMPP, WAMP, etc.)</li> </ul>
<b>Week 2</b>	<ul style="list-style-type: none"> <li>• Writing basic PHP scripts, Variable declaration and manipulation</li> </ul>
<b>Week 3</b>	<ul style="list-style-type: none"> <li>• Applying predefined functions ( string &amp; math)</li> </ul>
<b>Week 4</b>	<ul style="list-style-type: none"> <li>• Creating a simple HTML webpage, Embedding PHP code within HTML , Displaying dynamic content with PHP</li> </ul>

<b>Week 5</b>	<ul style="list-style-type: none"> <li>Creating a form with HTML, Processing form data with PHP</li> </ul>
<b>Week 6</b>	<ul style="list-style-type: none"> <li>Implementing form validation and error handling</li> </ul>
<b>Week 7</b>	<ul style="list-style-type: none"> <li>Setting up a local database server (MySQL, MariaDB, etc.), Establishing a database connection in PHP</li> </ul>
<b>Week 8</b>	<ul style="list-style-type: none"> <li>Executing SQL queries and retrieving data</li> </ul>
<b>Week 9</b>	<ul style="list-style-type: none"> <li>Implementing user registration and login functionality, Managing user sessions using PHP</li> </ul>
<b>Week 10</b>	<ul style="list-style-type: none"> <li>Implementing basic authentication and access control</li> </ul>
<b>Week 11</b>	<ul style="list-style-type: none"> <li>Uploading files with PHP, Validating and storing uploaded file.</li> </ul>
<b>Week 12</b>	<ul style="list-style-type: none"> <li>Displaying uploaded files on a webpage</li> </ul>
<b>Week 13</b>	<ul style="list-style-type: none"> <li>Making API requests using PHP, Parsing and processing API responses (JSON, XML),integrating external API data into a web application</li> </ul>
<b>Week14</b>	<ul style="list-style-type: none"> <li>Project Discussion</li> </ul>
<b>Week15</b>	<ul style="list-style-type: none"> <li>Final Exam</li> </ul>

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	<p><b>Textbook:</b></p> <ol style="list-style-type: none"> <li>3. "PHP and MySQL Web Development" by Luke Welling and Laura Thomson, Addison-Wesley Professional, 2016</li> <li>4. "Modern PHP: New Features and Good Practices" by Josh Lockhart, 2015</li> </ol>	Yes (E-copy)
<b>Recommended Texts</b>	PHP for the Web: Visual Quick Start Guide" by Larry Ullman:	Yes (E-copy)
<b>Websites</b>	W3Schools PHP Tutorial: ( <a href="http://www.w3schools.com/php">www.w3schools.com/php</a> )	

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
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<b>Success Group</b> <b>(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</b> <b>(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	Computer Vision		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	UoB12345			
ECTS Credits	6			
SWL (hr/sem)	77			
Module Level	4	Semester of Delivery		1
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	Hikmat Z. Neima		e-mail	Hikmat.taher@uobasrah.edu.iq
Module Leader's Acad. Title	Lecturer		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	15/06/2023	Version Number	1.0	

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

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p><b>Module Aims</b> أهداف المادة الدراسية</p>	<p>Here are some module aims typically associated with a Computer Vision course. These aims describe the overarching goals and objectives of the course:</p> <ol style="list-style-type: none"> <li>15. To provide students with a solid understanding of the fundamental concepts and principles of image processing.</li> <li>16. To familiarize students with the methods that are deal with image processing.</li> <li>17. To develop students' understanding of fundamentals of mathematics, enabling them to analyze images that are processed.</li> <li>18. To give students an opportunity to strongly understand and apply the well-known image processing methods and algorithms.</li> <li>19. To introduce students to the computer vision concepts.</li> <li>20. To clarify the relationship between image processing and computer vision.</li> <li>21. To introduces students to the fundamental concepts of computer vision providing an overview of the current methodologies and techniques.</li> <li>22. To enable students exploring the theory behind fundamental processing tasks, including segmentation, feature extraction, image classification, and object detection, using a mathematical framework to analyze images as two-dimensional signals.</li> </ol> <p>This module aims to provide a broad overview of the goals and objectives of a Computer Vision course.</p>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<p>Here are some module learning outcomes that are typically associated with a Computer Vision course. These outcomes represent the knowledge, skills, and competencies that students are expected to achieve upon completing the course:</p> <ol style="list-style-type: none"> <li>16. Understand the fundamental components and principles of image processing.</li> <li>17. Understand the fundamental components and principles of computer vision.</li> <li>18. By the end of this course, students will be able to apply the basic principles and tools used in image processing.</li> <li>19. Students will be able to apply the basic principles and tools used in computer vision.</li> <li>20. Students will be able to solve practical problems in scientific and commercial settings.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<p><b>Strategies</b></p>	<p>When teaching a Computer Vision course to beginners, it's important to adopt strategies that cater to their foundational understanding and gradually build their</p>
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knowledge and skills. Here are some effective learning and teaching strategies for beginners in a Computer Organization & Architecture course:

13. **Visual Aids and Analogies:** Use visual aids such as diagrams, charts, and illustrations to simplify complex concepts. Analogies comparing computer components to familiar real-world objects can make abstract ideas more relatable and easier to understand.
14. **Step-by-Step Approach:** Break down complex topics into smaller, manageable steps. Present the material in a sequential manner, building upon previously covered concepts. This helps beginners grasp the fundamentals before moving on to more advanced topics.
15. **Direct Activities:** Provide firsthand activities that allow beginners to interact with hardware components or simulation software. This can include assembling simple computer systems, performing basic circuit simulations, or writing simple programs. Direct activities reinforce learning and make abstract concepts more tangible.
16. **Practical Examples:** Use practical examples and real-life scenarios to demonstrate the relevance and application of the concepts being taught. Relate the material to everyday situations or commonly used technologies to help beginners connect theory to practice.
17. **Scaffolding:** Provide scaffolding support by gradually reducing assistance as students gain confidence and proficiency. Start with guided exercises and gradually increase the level of complexity and autonomy. This helps beginners develop their critical thinking skills and independent thinking.
18. **Interactive Discussions:** Encourage interactive discussions to promote active engagement and peer learning. Beginners can ask questions, share their perspectives, and learn from their classmates' experiences. This fosters a supportive learning environment where beginners can build their understanding collaboratively.
19. **Concept Mapping and Summarizing:** Encourage beginners to create concept maps or summaries of the material covered. Concept maps visually organize the relationships between different concepts, while summaries help reinforce understanding and retention.
20. **Concrete Examples:** Use concrete examples and familiar scenarios to explain abstract concepts. Relate computer organization and architecture to everyday experiences, such as explaining how a CPU functions like the brain of a computer or how cache memory is like a high-speed storage closet.
21. **Incremental Assessments:** Break assessments into smaller, incremental tasks to evaluate and reinforce learning along the way. This can include quizzes, short assignments, or mini projects that gradually increase in complexity as beginners progress through the course.
22. **Encourage Questions:** Create a supportive environment that encourages beginners to ask questions without hesitation. Answer questions patiently and provide explanations in a clear and accessible manner. This helps beginners clarify their doubts and deepen their understanding.
23. **Provide Additional Resources:** Offer supplementary resources, such as textbooks, online tutorials, and reference materials, to support beginners' learning outside the classroom. These resources can provide alternative explanations, additional examples, and further practice opportunities.
24. **Regular Feedback and Guidance:** Provide timely and constructive feedback on assignments and assessments to guide beginners' progress. Highlight their

	<p>strengths and provide specific suggestions for improvement to help them grow and build confidence.</p> <p>By employing these strategies, you can create an inclusive and supportive learning environment for beginners in a Computer Organization &amp; Architecture course. Adjust the pace and depth of the course to accommodate their learning needs and gradually build their knowledge and skills in the subject.</p>		
<b>Student Workload (SWL)</b>			
الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	45	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	80	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

<b>Module Evaluation</b>					
تقييم المادة الدراسية					
		<b>Time/Number</b>	<b>Weight (Marks)</b>	<b>Week Due</b>	<b>Relevant Learning Outcome</b>
<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>	2 hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

<b>Delivery Plan (Weekly Syllabus)</b>	
المنهاج الأسبوعي النظري	
	<b>Material Covered</b>
<b>Week 1</b>	<p>Introduction to Image Processing</p> <ul style="list-style-type: none"> <li>Image Representation</li> <li>Image Types</li> </ul>
<b>Week 2</b>	Describe human color perception and representation.
<b>Week 3</b>	<p>Color Models</p> <ul style="list-style-type: none"> <li>RGB</li> </ul>

	<ul style="list-style-type: none"> <li>• HSV</li> </ul>
<b>Week 4</b>	Basic Image Operations <ul style="list-style-type: none"> <li>• Point Operators</li> <li>• Geometrical Operators</li> </ul>
<b>Week 5</b>	Local Operators <ul style="list-style-type: none"> <li>• Linear Operators (convolutions)</li> <li>• Morphological Operators (dilation and erosions)</li> </ul>
<b>Week 6</b>	Binary Images <ul style="list-style-type: none"> <li>• Geometric operations on binary images.</li> </ul>
<b>Week 7</b>	Mid Term Exam
<b>Week 8</b>	Gray Scale Images <ul style="list-style-type: none"> <li>• Image Histogram</li> <li>• Histogram Equalization</li> <li>• Histogram Stretching</li> </ul>
<b>Week 9</b>	<ul style="list-style-type: none"> <li>• Edge Detection Algorithms.</li> <li>• Sobol Operator</li> <li>• Canny Operator</li> </ul>
<b>Week 10</b>	<ul style="list-style-type: none"> <li>• Image Segmentation Algorithms</li> <li>• Segmentation based on Histogram</li> </ul>
<b>Week 11</b>	<ul style="list-style-type: none"> <li>• Image Segmentation Algorithms</li> <li>• Segmentation based on clustering</li> </ul>
<b>Week 12</b>	<ul style="list-style-type: none"> <li>• Image Stitching Application</li> <li>• SIFT</li> </ul>
<b>Week 13</b>	<ul style="list-style-type: none"> <li>• Image Stitching Application</li> <li>• RANSAC</li> </ul>
<b>Week 14</b>	<ul style="list-style-type: none"> <li>• Motion</li> <li>• Optic Flow</li> <li>• Normalized Cross Correlation</li> </ul>
<b>Week 15</b>	General Discussion
<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: Introduction to Matlab
<b>Week 2</b>	Lab 2: Matlab environment overview
<b>Week 3</b>	Lab 3: Reading and writing an image
<b>Week 4</b>	Lab 4: Simple operations on images
<b>Week 5</b>	Lab 5: Image histogram
<b>Week 6</b>	Lab 6: Image histogram enhancement

<b>Week 7</b>	Lab 7: Edge Detection
<b>Week 8</b>	Lab 8: Edge Detection
<b>Week 9</b>	Lab 9: Lab Test
<b>Week 10</b>	Lab 10: Image Segmentation
<b>Week 11</b>	Lab 11: Image Segmentation
<b>Week 12</b>	Lab 12: Apply of SIFT
<b>Week 13</b>	Lab 13: Apply of SIFT
<b>Week 14</b>	Lab 14: Apply of optical flow
<b>Week 15</b>	Lab 15: General Review

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	<p><b>"Computer Organization and Architecture: Designing for Performance" by William Stallings:</b></p> <ul style="list-style-type: none"> <li>➤ This textbook provides a comprehensive introduction to computer organization and architecture, with a focus on performance design principles. It covers topics such as CPU organization, memory hierarchy, instruction set architecture, and I/O systems. The book includes numerous examples, illustrations, and exercises to reinforce concepts.</li> </ul>	
<b>Recommended Texts</b>	<p><b>"Structured Computer Organization" by Andrew S. Tanenbaum and Todd Austin:</b></p> <ul style="list-style-type: none"> <li>➤ This book provides a structured approach to computer organization and architecture. It covers fundamental concepts, including digital logic, data representation, CPU organization, memory systems, and I/O systems. The text emphasizes the importance of hierarchical organization in computer systems and includes numerous examples and exercises to reinforce learning.</li> </ul>	
<b>Websites</b>		

### Grading Scheme

#### مخطط الدرجات

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

<b>(50 - 100)</b>	<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
<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.				

## MODULE DESCRIPTION FORM

### نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Cyber Security</b>		Module Delivery
Module Type	<b>Core</b>		<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	<b>UoB12345</b>		
ECTS Credits	<b>6</b>		
SWL (hr/sem)	<b>150</b>		
Module Level	4	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Name	e-mail	E-mail
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	01/06/2023	Version Number	1.0
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Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
<b>Module Aims</b> أهداف المادة الدراسية	<p>The exposure of the students to Cyber Security should lead to the following:-</p> <ul style="list-style-type: none"> <li>(a) Learn the foundations of Cyber security and threat landscape.</li> <li>(b) To equip students with the technical knowledge and skills needed to protect and defend against cyber threats.</li> <li>(c) To develop skills in students that can help them plan, implement, and monitor cyber security mechanisms to ensure the protection of information technology assets.</li> <li>(d) To expose students to governance, regulatory, legal, economic, environmental, social and ethical contexts of cyber security.</li> <li>(e) To expose students to responsible use of online social media networks.</li> <li>(f) To systematically educate the necessity to understand the impact of cyber crimes and threats with solutions in a global and societal context.</li> <li>(g) To select suitable ethical principles and commit to professional responsibilities and human values and contribute value and wealth for the benefit of the society.</li> </ul>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<p>Upon completion of the degree program, students will be able to:-</p> <ul style="list-style-type: none"> <li>(a) Understand the cyber security threat landscape.</li> <li>(b) Develop a deeper understanding and familiarity with various types of cyberattacks, cyber crimes, vulnerabilities and remedies thereto.</li> <li>(c) Analyse and evaluate existing legal framework and laws on cyber security.</li> <li>(d) Analyse and evaluate the digital payment system security and remedial measures against digital payment frauds.</li> <li>(e) Analyse and evaluate the importance of personal data its privacy and security.</li> <li>(f) Analyse and evaluate the security aspects of social media platforms and ethical aspects associated with use of social media.</li> <li>(g) Analyse and evaluate the cyber security risks. (h) Based on the Risk assessment, plan suitable security controls , audit and compliance.</li> <li>(i) Evaluate and communicate the human role in security systems with an emphasis on ethics, social engineering vulnerabilities and training.</li> </ul>

	(j) Increase awareness about cyber-attack vectors and safety against cyber-frauds. (k) Take measures for self-cyber-protection as well as societal cyber-protection.
<b>Indicative Contents</b> المحتويات الإرشادية	<ul style="list-style-type: none"> <li>• Introduction to Cyber security.</li> <li>• Cyber crime and Cyber law.</li> <li>• Social Media Overview and Security.</li> <li>• E - Commerce and Digital Payments.</li> <li>• Digital Devices Security , Tools and Technologies for Cyber Security.</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 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 types 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	77	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	73	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	
<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>	2 hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الأسبوعي النظري

	Material Covered
Week 1	Introduction to Cyber security.
Week 2	Defining Cyberspace and Overview of Computer and Web-technology, Architecture of cyberspace.
Week 3	Concept of cyber security.
Week 4	Cyber crime and Cyber law.
Week 5	Classification of cyber crimes, Common cyber crimes- cyber crime targeting computers and mobiles.
Week 6	Legal perspective of cyber crime.
Week 7	Mid-term Exam.
Week 8	Social Media Overview and Security.
Week 9	Types of Social media.
Week 10	Social media privacy, Challenges, opportunities and pitfalls in online social network.
Week 11	E - Commerce and Digital Payments.
Week 12	Main components of E-Commerce.
Week 13	Cyber Security best practices.
Week 14	Digital Devices Security , Tools and Technologies for Cyber Security.
Week 15	General Discussion.
Week 16	Preparatory week before the final Exam.

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Implement Practical hands-on.
Week 2	Lab 2: Implement checklist for reporting cyber crime at Cyber crime Police Station.
Week 3	Lab 3: Implement checklist for reporting cyber crime online.
Week 4	Lab 4: Implement reporting phishing emails.
Week 5	Lab 5: Implement demonstration of email phishing attack and preventive measures.
Week 6	Lab 6: Implement basic checklist, privacy and security settings for popular Social media platforms.

<b>Week 7</b>	Lab 7: Implement reporting and redressal mechanism for violations and misuse of Social media platforms.
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<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	Text	Available in the Library?
<b>Required Texts</b>	R. C Mishra, "Cyber Crime Impact in the New Millennium", Auther Press. Edition 2010.	No
<b>Recommended Texts</b>	Sumit Belapure, and Nina Godbole , "Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", Wiley India Pvt. Ltd., First Edition, 2011.	No
<b>Websites</b>		

<b>Grading Scheme</b> 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
<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.				

## MODULE DESCRIPTION FORM

### نموذج وصف المادة الدراسية

<b>Module Information</b> معلومات المادة الدراسية			
<b>Module Title</b>	<b>Operating Systems</b>		<b>Module Delivery</b>
<b>Module Type</b>	<b>Core</b>		<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>	<b>CS401</b>		
<b>ECTS Credits</b>	<b>6</b>		
<b>SWL (hr/sem)</b>	<b>150</b>		
<b>Module Level</b>	4	<b>Semester of Delivery</b>	
<b>Administering Department</b>	Computer Science	<b>College</b>	Computer Science & Information Technology
<b>Module Leader</b>	Dr. Salah F. Saleh	<b>e-mail</b>	aldarraji@uobasrah.edu.iq
<b>Module Leader's Acad. Title</b>	Assistant Professor	<b>Module Leader's Qualification</b>	Ph.D.
<b>Module Tutor</b>		<b>e-mail</b>	
<b>Peer Reviewer Name</b>		<b>e-mail</b>	
<b>Scientific Committee Approval Date</b>	01/06/2023	<b>Version Number</b>	1.0

<b>Relation with other Modules</b> العلاقة مع المواد الدراسية الأخرى			
<b>Prerequisite module</b>	CS206	<b>Semester</b>	4
<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 Objectives</b></p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Understand the role and significance of operating systems in modern computer systems.</li><li>2. Comprehend the basic functionalities and components of operating systems.</li><li>3. Explore various operating system structures, designs, and implementation techniques.</li><li>4. Analyze the mechanisms for process management, including process creation, scheduling, synchronization, and communication.</li><li>5. Study memory management techniques, such as virtual memory, paging, and segmentation.</li><li>6. Investigate file systems and their organization, including file organization, access methods, and disk management.</li><li>7. Examine input/output (I/O) systems, device management, and the handling of interrupts.</li><li>8. Discuss the concepts of protection and security in operating systems.</li><li>9. Evaluate performance evaluation and tuning techniques for operating systems.</li><li>10. Explore emerging trends and advancements in operating systems, such as distributed systems, virtualization, and cloud computing.</li></ol>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>Upon successful completion of the Operating Systems course, students should be able to:</p> <ol style="list-style-type: none"><li>1. Explain the key functions and significance of operating systems in modern computer systems.</li><li>2. Identify and describe the major types of operating systems, their characteristics, and their applications.</li><li>3. Understand the fundamental concepts and components of operating systems, including processes, threads, and scheduling algorithms.</li><li>4. Analyze and evaluate process management techniques, such as process creation, synchronization, and communication.</li><li>5. Demonstrate knowledge of memory management techniques, including virtual memory, paging, and segmentation.</li><li>6. Design and implement file systems, considering file organization, access methods, and disk management strategies.</li><li>7. Understand input/output systems, device management, and interrupt handling in operating systems.</li><li>8. Discuss the concepts of protection and security in operating systems, including access control and cryptography techniques.</li></ol>

	<p>9. Apply performance evaluation and tuning techniques to optimize the performance of operating systems.</p> <p>10. Explore and discuss emerging trends and advancements in operating systems, such as distributed systems, virtualization, and cloud computing.</p> <p>By achieving these learning outcomes, students will have a solid understanding of operating system principles, allowing them to effectively analyze, design, and implement operating systems and make informed decisions regarding their usage and configuration in various computing environments.</p>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p>Here are some common topics that are typically covered in an Operating Systems course:</p> <ol style="list-style-type: none"> <li>1. Introduction to Operating Systems: <ul style="list-style-type: none"> <li>• Definition and goals of an operating system</li> <li>• Evolution and historical perspective of operating systems</li> <li>• Major types of operating systems (batch, time-sharing, real-time, distributed)</li> <li>• Operating system services and functionalities</li> </ul> </li> <li>2. Process Management: <ul style="list-style-type: none"> <li>• Process concept and process states</li> <li>• Process scheduling algorithms (e.g., FCFS, SJF, Round Robin)</li> <li>• Process synchronization and mutual exclusion</li> <li>• Inter-process communication mechanisms</li> <li>• Deadlock detection and prevention techniques</li> </ul> </li> <li>3. Memory Management: <ul style="list-style-type: none"> <li>• Address spaces and memory partitioning</li> <li>• Memory allocation strategies (e.g., contiguous allocation, paging, segmentation)</li> <li>• Virtual memory concepts and techniques</li> <li>• Page replacement algorithms (e.g., FIFO, LRU)</li> <li>• Memory protection and sharing</li> </ul> </li> <li>4. File Systems: <ul style="list-style-type: none"> <li>• File concept and file organization</li> <li>• Directory structures and file operations</li> <li>• File allocation methods (e.g., contiguous, linked, indexed)</li> <li>• Disk scheduling algorithms (e.g., FCFS, SSTF, SCAN)</li> <li>• File system implementation and maintenance</li> </ul> </li> <li>5. Input/Output Systems: <ul style="list-style-type: none"> <li>• I/O devices and device drivers</li> <li>• I/O operations and buffering</li> </ul> </li> </ol>

	<ul style="list-style-type: none"> <li>• Interrupt handling and interrupt-driven I/O</li> <li>• Disk management and scheduling</li> <li>• File system consistency and recovery</li> </ul> <p>6. Process Communication and Synchronization:</p> <ul style="list-style-type: none"> <li>• Shared memory and message passing mechanisms</li> <li>• Semaphores, monitors, and locks for synchronization</li> <li>• Classical synchronization problems (e.g., producer-consumer, readers-writers)</li> <li>• Interprocess communication protocols and mechanisms</li> </ul> <p>Protection and Security:</p> <ul style="list-style-type: none"> <li>• Access control and permissions</li> <li>• User authentication and authorization</li> <li>• Security threats and vulnerabilities</li> <li>• Cryptography and encryption techniques</li> <li>• Security mechanisms in operating systems</li> </ul>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<p>In the context of the Operating Systems course, here are some strategies that can help students excel:</p> <ol style="list-style-type: none"> <li>1. <b>Active Participation:</b> Actively engage in class discussions, ask questions, and contribute to group activities. This promotes a deeper understanding of the material and encourages critical thinking.</li> <li>2. <b>Take Detailed Notes:</b> Take thorough and organized notes during lectures, ensuring you capture key concepts, definitions, and examples. Review and summarize your notes regularly to reinforce your understanding.</li> <li>3. <b>Practice Programming:</b> Operating Systems often involve programming assignments. Dedicate time to practice programming concepts related to</li> </ol>

processes, memory management, file systems, and I/O operations. Experiment with sample code and work on programming projects to strengthen your skills.

4. **Hands-on Labs:** Make the most of the hands-on lab sessions provided in the course. These sessions offer an opportunity to apply theoretical knowledge and gain practical experience with operating system concepts. Complete lab exercises diligently and seek help from instructors or teaching assistants if needed.
5. **Read the Recommended Textbooks:** Consult the recommended textbooks and supplementary reading materials suggested by the course instructor. These resources provide additional explanations, examples, and insights into operating system concepts. Read actively, take notes, and reflect on the content.
6. **Collaborate with Peers:** Form study groups or join online discussion forums with classmates to discuss and review course materials. Collaborative learning can deepen your understanding by exposing you to different perspectives and approaches.
7. **Review and Reinforce:** Regularly review your notes, textbooks, and assignments to reinforce your understanding of operating system concepts. Look for connections between different topics and strive to develop a holistic understanding of how the various components of an operating system interact.
8. **Seek Clarification:** Do not hesitate to seek clarification from the instructor or teaching assistants if you have any doubts or questions. Clarifying misunderstandings early on can prevent confusion later and ensure a solid foundation for advanced topics.
9. **Explore Real-world Examples:** Supplement your learning by exploring real-world examples of operating systems and their applications. Investigate case studies, research papers, or industry articles to gain insight into practical implementations and emerging trends.

	10. Practice Time Management: Plan your study time effectively to ensure you allocate sufficient time for reading, assignments, and exam preparation. Create a schedule and adhere to it, breaking down complex tasks into manageable segments.
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<b>Student Workload (SWL)</b>			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	77	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	73	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>150</b>		

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

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Introduction to Operating Systems <ul style="list-style-type: none"><li>• Definition, goals, and functions of an operating system</li><li>• Evolution and historical perspectives of operating systems</li></ul>
<b>Week 2</b>	Introduction to Operating Systems <ul style="list-style-type: none"><li>• Major types of operating systems (e.g., batch, time-sharing, real-time, distributed)</li></ul>
<b>Week 3</b>	Process Management <ul style="list-style-type: none"><li>• Process concept and process states</li><li>• Process scheduling algorithms</li></ul>
<b>Week 4</b>	Process synchronization and inter-process communication
<b>Week 5</b>	Deadlock detection and prevention
<b>Week 6</b>	Memory Management
<b>Week 7</b>	<b>Mid-term Exam</b>
<b>Week 8</b>	Virtual memory and paging techniques
<b>Week 9</b>	Memory segmentation and protection
<b>Week 10</b>	File Systems <ul style="list-style-type: none"><li>• File concept and file organization</li><li>• Directory structures and file access methods</li></ul>
<b>Week 11</b>	File Systems <ul style="list-style-type: none"><li>• Disk management and file allocation strategies</li></ul>
<b>Week 12</b>	Input/Output Systems
<b>Week 13</b>	Protection and Security
<b>Week 14</b>	Performance Evaluation and Tuning
<b>Week 15</b>	Emerging Trends in Operating Systems

<b>Week 16</b>	<b>Preparatory week before the final Exam</b>
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<b>Delivery Plan (Weekly Lab. Syllabus)</b>	
المنهاج الاسبوعي للمختبر	
	<b>Material Covered</b>
<b>Week 1</b>	Lab 1: Introduction to Operating System Environment <ul style="list-style-type: none"> <li>• Setting up the development environment (e.g., virtual machines, emulators)</li> <li>• Familiarization with command-line interfaces and basic shell commands</li> <li>• Exploring system utilities and tools for system monitoring and troubleshooting</li> </ul>
<b>Week 2</b>	Lab 2: Process Management <ul style="list-style-type: none"> <li>• Implementing process creation and termination routines</li> <li>• Designing and implementing process scheduling algorithms (e.g., Round Robin, Priority Scheduling)</li> <li>• Simulating and analyzing the behavior of different scheduling algorithms</li> <li>• Implementing inter-process communication mechanisms (e.g., shared memory, message passing)</li> </ul>
<b>Week 3</b>	Lab 3: Memory Management <ul style="list-style-type: none"> <li>• Implementing memory allocation algorithms (e.g., First Fit, Best Fit, Buddy System)</li> <li>• Simulating and analyzing the behavior of different memory allocation algorithms</li> <li>• Implementing virtual memory techniques (e.g., page tables, demand paging)</li> <li>• Evaluating the performance impact of different page replacement algorithms</li> </ul>
<b>Week 4</b>	Lab 4: File System Implementation <ul style="list-style-type: none"> <li>• Designing and implementing basic file operations (e.g., create, delete, read, write)</li> <li>• Implementing file allocation methods (e.g., contiguous, linked, indexed)</li> <li>• Simulating and evaluating the performance of different file allocation methods</li> <li>• Implementing directory structures and file access control mechanisms</li> </ul>
<b>Week 5</b>	Lab 5: I/O System and Device Management <ul style="list-style-type: none"> <li>• Implementing device driver routines for I/O devices</li> <li>• Handling interrupts and implementing interrupt-driven I/O</li> </ul>

	<ul style="list-style-type: none"> <li>Analyzing and optimizing disk scheduling algorithms</li> <li>Simulating and benchmarking I/O performance for different devices and workloads</li> </ul>
<b>Week 6</b>	<p>Lab 6: Process Synchronization and Deadlock Avoidance</p> <ul style="list-style-type: none"> <li>Implementing synchronization primitives (e.g., semaphores, monitors, locks)</li> <li>Solving classical synchronization problems (e.g., producer-consumer, readers-writers)</li> <li>Analyzing and detecting deadlock scenarios</li> <li>Implementing deadlock avoidance techniques (e.g., resource allocation graphs)</li> </ul>
<b>Week 7</b>	<b>Mid-term Exam</b>
<b>Week 8</b>	<p>Lab 7: Protection and Security Mechanisms</p> <ul style="list-style-type: none"> <li>Implementing access control mechanisms (e.g., permissions, access control lists)</li> <li>Designing and implementing user authentication and authorization routines</li> <li>Exploring cryptographic algorithms and implementing encryption techniques</li> <li>Analyzing and mitigating common security threats in an operating system</li> </ul>
<b>Week 9</b>	<p>Lab 8: Performance Analysis and Optimization</p> <ul style="list-style-type: none"> <li>Profiling and monitoring system performance using performance measurement tools</li> <li>Analyzing and optimizing CPU scheduling policies</li> <li>Evaluating and optimizing I/O performance</li> <li>Analyzing system resource utilization and identifying performance bottlenecks</li> </ul>
<b>Week 10</b>	<p>Lab 9: Distributed Systems and Virtualization</p> <ul style="list-style-type: none"> <li>Setting up a simple distributed system environment</li> <li>Implementing remote procedure calls (RPC) or message passing between distributed processes</li> <li>Exploring virtualization technologies and setting up virtual machines</li> <li>Experimenting with containerization technologies (e.g., Docker)</li> </ul>
<b>Week 11</b>	<p>Lab 10: Case Study and Project</p> <ul style="list-style-type: none"> <li>Analyzing and discussing case studies of real-world operating systems</li> <li>Working on a project that involves implementing an operating system component or exploring an emerging operating system topic</li> </ul>

- Presenting and demonstrating the project to the class

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	<p>"Operating System Concepts" by Abraham Silberschatz, Peter B. Galvin, and Greg Gagne.</p> <p>This widely used textbook provides a comprehensive introduction to operating systems, covering the fundamental concepts, principles, and implementation details.</p>	Yes
<b>Recommended Texts</b>	<ol style="list-style-type: none"> <li>1. "Modern Operating Systems" by Andrew S. Tanenbaum and Herbert Bos.</li> <li>2. This book offers a thorough examination of modern operating system design and implementation, including topics such as process management, memory management, file systems, and security.</li> <li>3. "Operating Systems: Internals and Design Principles" by William Stallings.</li> <li>4. This textbook provides an in-depth exploration of operating system internals, focusing on design principles, algorithms, and system components. It covers topics such as process management, memory management, file systems, and distributed systems.</li> </ol>	No
<b>Websites</b>		

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
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<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	Information Security		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	UoB12345		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	4	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Name	e-mail	E-mail

<b>Module Leader's Acad. Title</b>	Professor	<b>Module Leader's Qualification</b>	Ph.D.
<b>Module Tutor</b>	Name (if available)	<b>e-mail</b>	E-mail
<b>Peer Reviewer Name</b>	Name	<b>e-mail</b>	E-mail
<b>Scientific Committee Approval Date</b>	01/06/2023	<b>Version Number</b>	1.0

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

<b>Module Aims, Learning Outcomes and Indicative Contents</b> أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
<b>Module Aims</b> أهداف المادة الدراسية	<p>This course provides students with the most common cryptographic algorithms and protocols and how to use cryptographic algorithms and protocols to secure distributed applications and computer networks:</p> <ul style="list-style-type: none"> <li>• Explain the objectives of information security.</li> <li>• Explain the importance and application of each of confidentiality, integrity, authentication and availability.</li> <li>• Understand various cryptographic algorithms.</li> <li>• Understand the basic categories of threats to computers and networks.</li> </ul>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<p>By the end of the course, students will be able to:</p> <ul style="list-style-type: none"> <li>• Understand the Cryptography principles and types.</li> <li>• Describe the computer systems security issues.</li> <li>• Student will be able to understand basic cryptographic algorithms, message and security issues.</li> <li>• Ability to identify information system requirements for both of them, such as, client and server.</li> <li>• Ability to understand the current issues towards information security.</li> <li>• Apply security principles to system design.</li> </ul>
<b>Indicative Contents</b> المحتويات الإرشادية	<ul style="list-style-type: none"> <li>• Introduction.</li> <li>• Basic Concepts and Terminology.</li> <li>• Classical Encryption Techniques.</li> <li>• Symmetric Cipher Model. <ul style="list-style-type: none"> <li>- Substitution Techniques.</li> <li>- Transposition Techniques.</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>• Block Ciphers and the Data Encryption Standard. <ul style="list-style-type: none"> <li>- Block Cipher Principles.</li> <li>- Differential and Linear Cryptanalysis.</li> <li>- Block Cipher Modes of Operation.</li> </ul> </li> <li>• Advanced Encryption Standard.</li> <li>• Stream Cipher.</li> </ul>
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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 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 types of simple experiments involving some sampling activities that are interesting to the students.
Student Workload (SWL)	
الحمل الدراسي للطالب	
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	62
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	88
<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>	2 hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

## Delivery Plan (Weekly Syllabus)

### المنهاج الأسبوعي النظري

	Material Covered
<b>Week 1</b>	Introduction.
<b>Week 2</b>	Model for Network Security.
<b>Week 3</b>	Classical Substitution Ciphers.
<b>Week 4</b>	Language Redundancy and Cryptanalysis.
<b>Week 5</b>	Vigener Cipher.
<b>Week 6</b>	Transposition Ciphers.
<b>Week 7</b>	Mid-term Exam.
<b>Week 8</b>	Block Ciphers and the Data Encryption Standard.
<b>Week 9</b>	Data Encryption Standard.
<b>Week 10</b>	Avalanche Effect.
<b>Week 11</b>	Modes of Operation: CTR.
<b>Week 12</b>	Rijndael Cipher.
<b>Week 13</b>	AES Key Expansion.
<b>Week 14</b>	Stream Cipher.
<b>Week 15</b>	General Discussion
<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: Implement Ceaser Cipher.
<b>Week 2</b>	Lab 2: Implement Vigenere Cipher.
<b>Week 3</b>	Lab 3: Implement Enigma Cipher.
<b>Week 4</b>	Lab 4: Implement DES Cipher.
<b>Week 5</b>	Lab 5: Implement AES Cipher.
<b>Week 6</b>	Lab 6: Implement Stream Cipher.
<b>Week 7</b>	Lab 7: Implement Statistical Tests.

## Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	William Stallings, "Cryptography and Network Security. Principle and Practice", Fourth Edition, Principle Hall, USA, 2006.	No
Recommended Texts	Alfred J. Menezes, Paul C. van Oorschot and Scott A. Vanstone, "Handbook of Applied Cryptography", Fifth Edition , CRC Press, 2001.	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	<b>Selected Topics in Computer Science</b>		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 checked="" type="checkbox"/> Seminar	
Module Code	UoB12345			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	4	Semester of Delivery		
Administering Department	Computer Science	College	Computer Science & Information Technology	
Module Leader	MOHAMED ABDULRAHMAN ABDULHAMID	e-mail	<a href="mailto:Mohammed@uobasrah.edu.iq">Mohammed@uobasrah.edu.iq</a>	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.S.	
Module Tutor	Name (if available)	e-mail	E-mail	
Peer Reviewer Name	Name	e-mail	E-mail	
Scientific Committee Approval Date	18/06/2023	Version Number	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Computer Thinking for Problem Solving	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	24. Getting students ready to keep up with new developments in computer science.
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	<p>25. Students gain practical experience with several modern Topic(s) such as (Bigdata,Data Science, Machine learning and so on)</p> <p>26. Getting an integrated plan to delve deeper into these topics and what is the road map to access them.</p> <p>27. Educating students to better compete in the job market.</p> <p>28. This is the basic subject for all Topic(s).</p>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>36. Refresh students' knowledge of their field of study.</p> <p>37. List the various terms associated with Topic(s).</p> <p>38. Summarize what is meant by a basic Topic(s).</p> <p>39. Discuss the reaction and involvement of Topic(s).</p> <p>40. Introducing the student to the road map for the Topic(s) and what steps need to be followed.</p>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Part A - Computing Theory</u></p> <p>Computer Generations – A timeline of the evolution of computer generations. Introduce the student to the future direction of computing, for example using a Quantum computer. [9 hrs]</p> <p>Computer science specializations – This includes the newest developments in computer science, such as new and future disciplines, frameworks, and modern programming languages. [9 hrs]</p> <p>Preparing and presenting the academic report - Preparing the student to understand the basics of writing and presenting the academic report in a clear and concise manner. [6 hrs]</p> <p>Problem Solving - Identify the most important steps to solving software problems. Provide some examples of this in practice as well. [15 hrs]</p> <p><u>Part B - Advanced Topics in Computer Science</u></p> <p>Fundamentals</p> <p>Distributed Systems, Parallel computing, Cloud computing and 5G and 4G technologies. Where these technologies are seen as the most important parts of the modern generation's growing technological progress. [18 hrs]</p>

	Topic(s) in Computer Science – Machine Learning Approaches, Deep Learning Approaches, Big data, Data Science, wireless sensor network. [18 hrs]
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	The main strategy that will be for this rich course will teach students the latest and most important developments in computer science. Which helps prepare computer science graduates capable of adapting to the job market. Also, by teaching students to write reports and make simple presentations while improving their critical thinking skills and effective ways to solve programming problems. In addition, interactive classrooms and tutorials will help students design simple experiments for the sampling activities they need. It must be mentioned that this course will be changing according to the department's directions to change topics in the field of computer science.

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	75	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	6
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	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, 7 and 13
	<b>Seminar</b>	1	10% (10)	9	LO # 3, 4, 5, 6, 7 and 13

	<b>Report</b>	1	10% (10)	13	LO # 6, 8,10 and 14
<b>Summative assessment</b>	<b>Midterm Exam</b>	2 hr	10% (10)	12	LO # 1-12
	<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 - Familiarize students with the course and directions of the course
<b>Week 2</b>	Introduction For Generations of Computer And beyond that
<b>Week 3</b>	Computing and Knowledge area of computer science
<b>Week 4</b>	Introduction for Problem Solving Using Computer (Refresh)
<b>Week 5</b>	Problem Analysis and Program Design Steps
<b>Week 6</b>	Practical examples by Problem Solving Steps
<b>Week 7</b>	Fundamentals of research methodology - Writing an effective academic report
<b>Week 8</b>	Fundamentals of research methodology - Make an effective presentation
<b>Week 9</b>	Seminar of students (Various topics in computer science)
<b>Week 10</b>	Fundamentals of Distributed Systems, Parallel computing.
<b>Week 11</b>	Basic of 5G and 4G technologies
<b>Week 12</b>	Mid Exam
<b>Week 13</b>	Introduction to Machine learning (ML) and Deep Learning (DL).
<b>Week 14</b>	Big Data Concept (Nominate a topic)
<b>Week 15</b>	Dealing with big data
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?

<b>Required Texts</b>	[1] Everything You Need to Ace Computer Science and Coding in One Big Fat Notebook: The Complete Middle School Study Guide (Big Fat Notebooks). Workman Publishing Company, 2020.	No
<b>Recommended Texts</b>	[2] Nielsen, M. A. (2015). Neural networks and deep learning (Vol. 25). San Francisco, CA, USA: Determination press. [3] Dietrich, D., Heller, B., & Yang, B. (2015). Data science & big data analytics: discovering, analyzing, visualizing and presenting data. Wiley.	No
<b>Websites</b>	<a href="https://www.coursera.org/learn/cs-algorithms-theory-machines">https://www.coursera.org/learn/cs-algorithms-theory-machines</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
<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

### نموذج وصف المادة الدراسية

<p><b>Module Information</b></p> <p>معلومات المادة الدراسية</p>
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Module Title	<b>Cloud Computing</b>		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory	
Module Code	<b>UoB12345</b>		<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	4	Semester of Delivery	1	
Administering Department	CS	College	CSIS	
Module Leader	ALI SALAH		e-mail	ali_s.hashim@uobasrah.edu.iq
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	M.Sc
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0	

### Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

### Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives	<ol style="list-style-type: none"> <li>1. Understand what cloud computing is and why it is important.</li> <li>2. Get a picture of the economics of cloud computing.</li> </ol>
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<p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> <li>3. Learn about many fundamental technologies that enable cloud computing, such as software defined architectures, virtualization, and containers.</li> <li>4. Learn about the different levels of clouds services, which include IaaS (Infrastructure as a Service), PaaS (Platform as a Service), SaaS (Software as a Service), MaaS (Metal as a Service), FaaS (Function as a Service (server-less architecture)).</li> <li>5. Compare the advantages and disadvantages of various cloud computing platforms.</li> <li>6. Analyze the performance, scalability, and availability of the underlying cloud technologies and software</li> </ol>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Analyze the trade-offs between deploying applications in the cloud and over the local infrastructure.</li> <li>2. Compare the advantages and disadvantages of various cloud computing platforms.</li> <li>3. Deploy applications over commercial cloud computing infrastructures such as Amazon Web Services, Windows Azure, and Google AppEngine.</li> <li>4. Program data intensive parallel applications in the cloud.</li> <li>5. Analyze the performance, scalability, and availability of the underlying cloud technologies and software.</li> <li>6. Identify security and privacy issues in cloud computing.</li> <li>7. Explain recent research results in cloud computing and identify their pros and cons.</li> <li>8. Solve a real-world problem using cloud computing through group collaboration.</li> </ol>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following:</p> <ul style="list-style-type: none"> <li>• <u>Introduction to Cloud Computing:</u> <ul style="list-style-type: none"> <li>• Defining Cloud Computing.</li> <li>• Exploring the roots of Cloud Computing. (2 hours)</li> </ul> </li> <li>• Cloud Computing Deployment Models: <ul style="list-style-type: none"> <li>• Overview of different deployment models such as public, private, hybrid, and community clouds. (2 hours)</li> </ul> </li> <li>• Cloud Service Models: <ul style="list-style-type: none"> <li>• Understanding Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). (2 hours)</li> </ul> </li> <li>• Characteristics of Cloud Computing: <ul style="list-style-type: none"> <li>• Examining the characteristics and key features of Cloud Computing.</li> <li>• Analyzing the advantages and disadvantages of adopting Cloud Computing. (4 hours)</li> </ul> </li> <li>• Cloud Computing Architecture Layers: <ul style="list-style-type: none"> <li>• Exploring the different layers of Cloud Computing architecture, including infrastructure, platform, and software layers.</li> <li>• Understanding the interactions and dependencies between these layers. (3 hours)</li> </ul> </li> <li>• Cloud Computing Methodologies: <ul style="list-style-type: none"> <li>• Overview of methodologies and best practices for implementing and managing Cloud Computing solutions. (2 hours)</li> </ul> </li> <li>• Cloud Application Architecture: <ul style="list-style-type: none"> <li>• Understanding the design principles and components of Cloud application architecture.</li> <li>• Exploring scalable and resilient application architectures. (3 hours)</li> </ul> </li> <li>• Virtualization Concepts: <ul style="list-style-type: none"> <li>• Introduction to virtualization technologies and their role in Cloud Computing.</li> <li>• Understanding virtual machines, hypervisors, and containerization. (3 hours)</li> </ul> </li> <li>• Moving Applications into the Cloud: <ul style="list-style-type: none"> <li>• Strategies and considerations for migrating applications to the Cloud.</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>• Exploring tools and techniques for seamless application migration. (3 hours)</li> <li>• Security in Cloud Computing: <ul style="list-style-type: none"> <li>• Understanding the security challenges and measures in Cloud Computing.</li> <li>• Exploring authentication, access control, data protection, and compliance in the Cloud. (4 hours)</li> </ul> </li> <li>• Basics of Cloud Management: <ul style="list-style-type: none"> <li>• Overview of Cloud management techniques and tools.</li> <li>• Understanding resource provisioning, monitoring, and optimization in the Cloud. (3 hours)</li> </ul> </li> <li>• Cloud Migration: <ul style="list-style-type: none"> <li>• Exploring the process and challenges of migrating systems and data to the Cloud.</li> <li>• Understanding the importance of planning, testing, and executing a successful migration. (3 hours)</li> </ul> </li> <li>• Daily Life Cloud Applications: <ul style="list-style-type: none"> <li>• Examining practical applications of Cloud Computing in everyday life.</li> <li>• Understanding how Cloud services impact various industries and sectors. (2 hours)</li> </ul> </li> <li>• Examples of Cloud Computing Applications: <ul style="list-style-type: none"> <li>• Studying prominent examples of Cloud Computing applications such as Google, Azure platform, and Amazon Web Services.</li> <li>• Exploring other Cloud-based applications found on the Internet, such as Force.com, SoundCloud, HyperOffice, and MyMusicCloud. (3 hours)</li> </ul> </li> </ul>
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<b>Learning and Teaching Strategies</b> 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 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 types of simple experiments involving some sampling activities that are interesting to the students.

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب ل ١٥ اسبوعا	
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<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	109	<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	91	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>200</b>		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	1	10% (10)	5 and 10	LO #1, #2 and #10, #11
	<b>Assignments</b>	2	20% (20)	2 and 12	LO #3, #4 and #6, #7
	<b>Projects / Lab.</b>	0	0% (0)		
	<b>Report</b>	0	0% (0)		
<b>Summative assessment</b>	<b>Midterm Exam</b>	2hr	20% (20)	7	LO #1 - #7
	<b>Final Exam</b>	3hr	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 to Cloud Computing.
<b>Week 2</b>	Defining the Cloud Computing, the roots of Cloud Computing

<b>Week 3</b>	Cloud Computing Deployment models, Cloud service models (IaaS, PaaS, SaaS).
<b>Week 4</b>	Characteristics of Cloud Computing/ advantages and disadvantages of adopting Cloud Computing
<b>Week 5</b>	Cloud Computing Architecture layers, Cloud Computing methodologies.
<b>Week 6</b>	Cloud application architecture
<b>Week 7</b>	Virtualization Concepts
<b>Week 8</b>	How to move application into the cloud
<b>Week 9</b>	Security in Cloud Computing.
<b>Week 10</b>	Basics of Cloud Management
<b>Week 11</b>	Cloud Migration
<b>Week 12</b>	Daily life Cloud's Application
<b>Week 13</b>	Examples of Cloud Computing applications: Google, Azure platform, Amazon Web Services. Other examples on the Internet such as Force.com, SoundCloud, HyperOffice, MyMusicCloud
<b>Week 14</b>	Collaborating using Google Cloud
<b>Week 15</b>	Disaster Recovery
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Surianarayanan, C., & Chelliah, P. R. (2019). Essentials of Cloud Computing.	No
<b>Recommended Texts</b>	L. Wang, R. Ranjan, J. Chen, and B. Benatallah, <i>Cloud Computing: Methodology, Systems, and Applications</i> , CRC Press, Boca Raton, FL, USA, ISBN: 9781439856413, October 2021.	No
<b>Websites</b>	Technical papers from major journals and major conferences on computing, networking, cloud computing	

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> <b>(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</b> <b>(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.