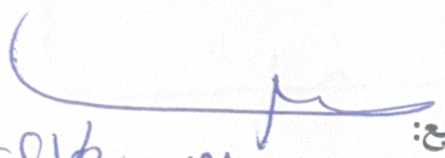
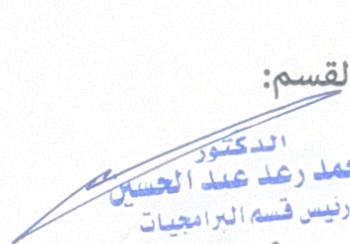


وزارة التعليم العالي والبحث العلمي
جهاز الإشراف والتقويم العلمي
دائرة ضمان الجودة والاعتماد الأكاديمي

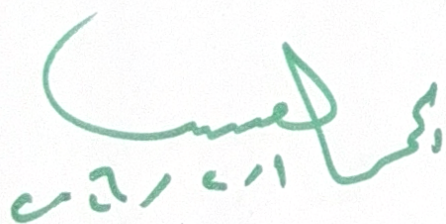
استمارة وصف البرنامج الأكاديمي للكليات و المعاهد

الجامعة: واسط
الكلية/ المعهد: كلية علوم الحاسوب وتكنولوجيا المعلومات
القسم العلمي: البرامجيات
تاريخ ملء الملف: 1/2/2026

التوقيع: 
اسم معاوني العلمي: د. محمد طلال محمد
التاريخ: ٢٠٢٦/٢/١

التوقيع: 
اسم رئيس القسم:
التاريخ:
الدكتور
احمد رعد عبد الحسين
رئيس قسم البرامجيات
٢٠٢٦/٢/١

دقق الملف من قبل
شعبة ضمان الجودة والأداء الجامعي
اسم مدير شعبة ضمان الجودة والأداء الجامعي:
التاريخ
التوقيع


مصادقة السيد العميد



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Data structure 2		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	Soft-221		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	2
Administering Department	Software	College	Computer science and IT
Module Leader	Huda lafta majeed	e-mail	hulafta@uowasit.edu.iq
Module Leader's Acad. Title		Module Leader's Qualification	Asst .prof. dr
Module Tutor	Huda lafta majeed	e-mail	E-mail
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	15\1\2026	Version Number	2

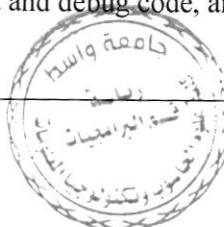
Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	none	Semester	
Co-requisites module	none	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Understanding the fundamental concepts of data structures Implementing data structures: This involves writing code Analyzing data structures: This includes analyzing the time and space complexity of operations performed on data structures



	Choosing appropriate data structures: This involves selecting the most appropriatedata structure for a given problem based on its time and space complexity requirements and other factors such as ease of use,
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Indicative content includes the following. . Knowledge of fundamental data structures . Ability to implement data structures . Analytical skills: Students should be able to analyze the time and space complexity of operations performed on data structures Problem-solving skills: Students should be able to apply data structures to solvereal-world problems, such as database management
Indicative Contents المحتويات الإرشادية	1. Introduction to data structures: This includes an overview of data structures, theirproperties, and how they are used to solve various problems. Arrays: This includes an introduction to arrays, their properties, and how they areused to store and manipulate data

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	There are several strategies that can be used when working with data structures: 1. Choosing the right data structure: One of the most important strategies is to choose the right data structure for the problem at hand. This involves understanding the properties and trade-offs of different data structures and selecting the one that is most appropriate for the specific problem. 2. Analyzing the time and space complexity: It is important to analyze the time and space complexity of operations performed on data structures. This involves understanding how the data structure is implemented and the cost of each operation in terms of time and memory. 3. Implementing data structures efficiently: When implementing data structures, it is important to use efficient algorithms and data structures that minimize the time andspace complexity of the operations performed on them. 4. Testing and debugging: As with any software development, testing and debugging are critical when working with data structures. It is important to test the data structure with a variety of inputs and edge cases to ensure that it works correctly andefficiently. 5. Modularizing code: Modularizing code can make it easier to work with data structures by breaking down complex tasks into smaller, more manageable pieces. This can make it easier to test and debug code, and can also make it easier to reusecode in other projects.

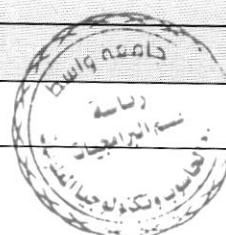


	Overall, the key strategies for working with data structures include choosing the right data structure, analyzing the time and space complexity, implementing efficiently, testing and debugging, modularizing code, and documenting code
--	---

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem)		Structured SWL (h/w)	
الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem)		Unstructured SWL (h/w)	
الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem)	150		
الحمل الدراسي الكلي للطالب خلال الفصل			

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

Delivery Plan (Weekly Syllabus)	
المنهاج الأسبوعي النظري	
	Material Covered
Week 1	



Week 2	Overview of data structures and their properties
Week 3	Types of data structures: arrays, linked lists, stacks, queues, trees, and graphs Basic operations on data structures
Week 4	Implementing a simple data structure in a programming language
Week 5	Introduction to arrays and linked lists
Week 6	Implementing arrays and linked lists in a programming language
Week 7	Introduction to stacks and queues Implementing stacks and queues
Week 8	Implementing stacks and queues
Week 9	Implementing graphs in a programming language Basic operations on graphs
Week 10	Introduction to advanced data structures: priority queues, heaps, tries, and suffix trees
Week 11	- Analyzing the time and space complexity of algorithms - Big O notation and other complexity measures
Week 12	Introduction to advanced graph algorithms
Week 13	Analyzing the time and space complexity of advanced graph algorithms
Week 14	Introduction to divide and conquer algorithms
Week 15	Implementing divide and conquer algorithms in a programming language Analyzing the time and space complexity of divide and conquer algorithms
Week 16	Final exam
Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي العملي	
	Material Covered
Week 1	Introduction to Data Structures
Week 2	Arrays and Linked Lists
Week 3	Introduction to trees



Week 4	• Introduction to graphs • Types of graphs: directed and undirected graphs, weighted and unweighted graphs
Week 5	Introduction to hash tables.
Week 6	Example to hash tables
Week 7	The addressing mode in 8 bit register
Week 8	Advanced Data Structures
Week 9	• Example Implementing advanced data structures in a programming language
Week 10	Basic operations on advanced data structures: searching, insertion, deletion, and sorting
Week 11	Implementing trees in a programming language
Week 12	Examples of Implementing trees in a programming language
Week 13	• Implementing backtracking algorithms in a programming language
Week 14	Examples
Week 15	Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	These texts are well-regarded in the field of data structures and algorithms, and can provide a solid foundation for students looking to learn about this important topic 4. Abel P., "IBM PC Assembly Language and Programming", 4th Edition, Prentice Hall, 1998.	
Recommended Texts	"Algorithms" , "Data Structures and Algorithms in Python" , Data Structures: Abstraction and Design Using Java", "Data Structures and Algorithms Made Easy: Data Structures and Algorithmic Puzzles	
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	Database 2		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	Soft-224		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	
Administering Department	Software	College	Computer science and IT
Module Leader	Ahmed Shaker abdalrada	e-mail	aabdala@uowasit.edu.iq
Module Leader's Acad. Title		Module Leader's Qualification	PhD
Module Tutor	Ahmed Shaker abdalrada	e-mail	E-mail
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	15\1\2026	Version Number	2

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 أهداف المادة الدراسية	A- Learning Objectives A1- To introduce the principles and fundamentals of databases, their systems, and types. A2- To apply database concepts. A3- To understand the importance of database concepts.



	A4- To identify the difference between traditional files and database concepts. A5- To identify the difference between databases and distributed database systems. A6- To be easy to use in describing database systems and systems. B- Technical Objectives of the Course B1- To reliably obtain lectures related to data requirements. B2- To be able to design a database system. B3- To be able to learn and practice on different systems and traditional and distributed databases. B4- To be able to manage dialogues and tens of thousands of them using database systems. Teaching and Learning Methods •Using technology when delivering lectures. •Writing computer programs specific to databases. •Providing the student with the main vocabulary and assistance related to database systems requirements. •Requiring the student to understand database systems. Assessment Methods •Homework assignments. •Daily quizzes. •Monthly exams. •Monthly reports. Semester Exams C- Affective and Value-Based Objectives C1- Choose a topic for the lecture C2- Participate in the lecture C3- Accept the lecture C4- Desire to attend the lecture
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Learning how to implement instructions using Microprocessor registers. 2. To provide a solid foundation on the fundamentals of microprocessors and applications.
Indicative Contents المحتويات الإرشادية	Introduction to Database Systems Data Models Entity Relational Model & Normalization



Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
-------------------	--

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل		Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل		Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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



Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Parallel Databases
Week 2	Parallel Databases
Week 3	Distributed Databases
Week 4	Distributed Databases
Week 5	Data Warehouses and Data Mining
Week 6	Data Warehouses and Data Mining
Week 7	Data Warehouses and Data Mining
Week 8	Data Warehouses and Data Mining
Week 9	Data Warehouses and Data Mining
Week 10	Data Warehouses and Data Mining
Week 11	Database Design Project
Week 12	Database Design Project
Week 13	Database Design Project
Week 14	Database Design Project
Week 15	Database Design Project
Week 16	Final Exam

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي العملي

	Material Covered
Week 1	Introduction to C#(Basics of C#, syntax, variables)
Week 2	Development Environment(Using Visual Studio)
Week 3	Windows Forms(Creating basic UI forms)
Week 4	Controls(Buttons, TextBox, Labels, DataGridView)
Week 5	Events(Click events, input handling)
Week 6	Database Connection(Connecting C# to SQL Server (ADO.NET))
Week 7	CRUD Operations(Insert, Update, Delete, Select)



Week 8	Exam 1
Week 9	Data Binding(Binding data to controls)
Week 10	Validation(Input validation techniques)
Week 11	Advanced UI(Forms navigation, menus)
Week 12	Reporting(Simple reports with data)
Week 13	Project Development(Start mini project (CRUD system))
Week 14	Project Completion(Finalizing project)
Week 15	Exam 2

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Introduction to database Management system by Dr. Satinder Bal Gupta - Fundamentals of Database Systems, 7th Edition. Ramez Elmasri,	
Recommended Texts		
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	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	Statistic		Module Delivery	
Module Type	Elective		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	Soft-225			
ECTS Credits	3			
SWL (hr/sem)	75			
Module Level	2	Semester of Delivery		2
Administering Department	Software	College	Computer science and IT	
Module Leader	Elaf Baha Alwan		e-mail	leccit2@uowasit.edu.iq
Module Leader's Acad. Title		Module Leader's Qualification	M.SC	
Module Tutor	Elaf Baha Alwan		e-mail	E-mail
Peer Reviewer Name		e-mail	E-mail	
Scientific Committee Approval Date	15/1/2026	Version Number	2	

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 أهداف المادة الدراسية	1. Provide students with fundamental knowledge of descriptive and inferential statistics. 2. Introduce methods of data collection, organization, and presentation. 3. Enable students to calculate statistical measures such as mean and standard deviation.



	4.Understand relationships between variables (correlation and regression). 5.Introduce basic probability concepts. 6.Develop data analysis and decision-making skills. 7.Use SPSS for statistical analysis. 8.Apply statistical methods to solve real-life problems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Organize and present data using tables and charts. 2. Calculate and interpret statistical measures. 3. Analyze relationships using correlation and regression. 4. Apply probability concepts. 5. Use SPSS to analyze and interpret data.
Indicative Contents المحتويات الإرشادية	· Introduction to statistics · Data collection methods · Data presentation · Measures of central tendency · Measures of dispersion · Probability basics · Probability distributions · Correlation · Regression · Hypothesis testing · Spss applications



Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Lectures, practical sessions, problem-solving, and hands-on training using SPSS, along with interactive discussions.

Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل		Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل		Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

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



Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Statistics
Week 2	Measures of Central Tendency: Arithmetic Mean
Week 3	Median
Week 4	Mode

Week 5	Measures of Dispersion: Variance
Week 6	Midterm Exam
Week 7	Range
Week 8	Standard Deviation
Week 9	Mean Deviation
Week 10	Exam
Week 11	Correlation
Week 12	Spearman
Week 13	Pearson
Week 14	Phi
Week 15	Regression
Week 16	Final Exam

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي العملي

	Material Covered
Week 1	Introduction to Statistics
Week 2	Example Measures of Central Tendency: Arithmetic Mean
Week 3	Examples and Applications Median
Week 4	Examples and Applications Mode.
Week 5	Measures of Dispersion: Variance
Week 6	Examples and Applications Range
Week 7	Examples and Applications Standard Deviation
Week 8	Examples and Applications Mean Deviation
Week 9	Examples and Applications Correlation
Week 10	Exam
Week 11	Examples and Applications Spearman
Week 12	Examples and Applications Pearson



Week 13	Examples and Applications Phi	
Week 14	Examples	
Week 15	Exam	
Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	· Walpole, R. E., et al. Probability and Statistics for Engineers and Scientists. Pearson. · Triola, M. F. Elementary Statistics. Pearson. · Freund, J. E. Mathematical Statistics. Pearson. · Montgomery, D. C., & Runger, G. C. Applied Statistics and Probability for Engineers. Wiley.	
Recommended Texts		
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	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	Microprocessor and Computer Architecture		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	Soft-221		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	
Administering Department	Software	College	Computer science and IT
Module Leader	Rusul Fadhil Zakur	e-mail	rzakor@uowasit.edu.iq
Module Leader's Acad. Title		Module Leader's Qualification	M.SC
Module Tutor	Rusul Fadhil Zakur	e-mail	E-mail
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	15\1\2026	Version Number	2

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 أهداف المادة الدراسية	1. Students acquire skills in dealing with the internal computer system infrastructure to provide a solid foundation in the basics of microprocessors and their applications 2. Inform students about the historical development of processors 3. Understand the microprocessor infrastructure 4. Knowing the processor command sets 5. Connecting input and output devices to the processor

	6. Show students the types of microprocessors 7. Introduce students to the basics of assembly language 8. Create new products using assembly language programming and solve real-time problems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Learning how to implement instructions using Microprocessor registers. 2. To provide a solid foundation on the fundamentals of microprocessors and applications.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction to Microprocessor and Microcomputer system. • Microprocessor Architecture and Register Set. • System Buses • Memory types and physical addressing. • I/O devices Instruction Set and Format Addressing Modes Introduction to Assembly Programming Language. • Arithmetic and logical Instructions (Shift and Rotate). • Program Control (interrupt and subroutine call).

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل		Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل		Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		



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

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to microprocessor
Week 2	Introduction to microcomputer system
Week 3	Microprocessor Architecture
Week 4	Register Set
Week 5	System Buses
Week 6	Memory types and physical addressing
Week 7	I/O devices
Week 8	Instruction Set and Format
Week 9	Addressing mode (real mode, protected mode)
Week 10	Introduction to Assembly Language Programming
Week 11	Arithmetic and logical Instructions (Shift and Rotate)
Week 12	Applying Examples
Week 13	Program Control (interrupt and subroutine call)

Week 14	Appling Examples
Week 15	Implement Full Program
Week 16	Final Exam

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي العملي

	Material Covered
Week 1	Data transfer instruction Load & MOVE
Week 2	Examples for Load & Move
Week 3	Arithmetic instruction ADD, SUB, MULT, DIV
Week 4	Examples of arithmetic instruction , and addition XCHN, COMP, JMP, JNZ.
Week 5	Logic instruction, shift , rotate, AND, OR, XOR NOR, NOT.
Week 6	Examples of logic instruction
Week 7	The addressing mode in 8 bit register
Week 8	Examples of direct register and Immediate register
Week 9	The addressing mode in 16 bit register
Week 10	Examples of direct, indirect, base, index, and base-index register
Week 11	The addressing mode in 32 bit register
Week 12	Examples of direct, indirect, base, index, and base-index register
Week 13	Bit scan and bit test register
Week 14	Examples
Week 15	Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Abel P., "IBM PC Assembly Language and Programming", 4th Edition, Prentice Hall, 1998. 2. M. M. Mano, "Computer system architecture" third edition, prentice Hall, 1993. 3. Walter A. Triebel, "The 80386, 80486, and Pentium® Processors Hardware, Software, and Interfacing", 1998. 4. Abel P., "IBM PC Assembly Language and Programming",	

	4th Edition, Prentice Hall, 1998.	
Recommended Texts		
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	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 DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Object Oriented Programming 2		Module Delivery
Module Type	CORE		- Theory Lecture - Lab - Practical Seminar
Module Code	Soft-223		
ECTS Credits	6		
SWL (hr/sem)	140		
Module Level	2	Semester of Delivery	1
Administering Department	Department of Computer Science	College	Computer Science
Module Leader	Name: Hasanain Flayyih hasan	e-mail	hasanain.f.h@uowasit.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	M.sc
Module Tutor	None	e-mail	E-mail
Peer Reviewer Name	Hasanain flayyih	e-mail	E-mail
Review Committee Approval	2025/2/	Version Number	



Relation With Other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	
Module Aims, Learning Outcomes and Indicative Contents			
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			

Module Aims أهداف المادة الدراسية	- Teaching the students the concept of functions and how to call and passing values to them, Function Overloading and Inline function concepts. - Studying the Basic of Object Oriented Programming (OOP) and its features (Encapsulation, Inheritance, Polymorphism). - Teaching students Constructor and Destructors, Friend Function and Friend Classes Constant Member Functions and Constant Objects, Static Data Member and Static Function, Pointer to Objects and Array of Objects. - Teaching students Operator Overloading (Unary and Binary Operator Overloading). - Teaching students Inheritance Feature with its types. - Teaching students Polymorphism Feature with virtual functions. - Teaching students Function Template and class Template.
Module Learning Outcomes مخرجات التعليم للمادة الدراسية	- Perform Functions Concepts such as passing parameters, Overloading and Inline. - Understanding the Concept of Object Oriented Programming: Object and Class, - Understanding the meaning of Constructor and Destructors. - Understanding the meaning of Friend Function and Friend Class - Perform Classes Constant Member Functions and Constant Objects, Static Data Member and Static Function. - Understanding the concept of Unary and Binary Operators Overloading. - Learn how to deal with types of Inheritances Single, Hierarchical, Multilevel, and Multiple Inheritance. - Capable of using Polymorphism and Dynamic Binding. - Give the student the ability of using Function Template and class Template.
Indicative Contents المحتويات الإرشادية	- Explain how to define Overloading and Inline functions, objects with encapsulation data, Constructor and Destructors functions. - Explain the use of Operators Overloading with various types of Inheritances. - Let the students see many examples about Polymorphism and Templates.



Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
-------------------	--

Student Workload (SWL)

الحمل الدراسي للطالب محسوب ل 15 اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	140		

Module Evaluation

تقييم المادة الدراسية

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



Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	➤ Introduction to Object Oriented Programming • Concept of Object Oriented Programming: Object, Class, Abstraction, Encapsulation, Inheritance, Polymorphism
Week 2	➤ Constructor and Destructors
Week 3	➤ Friend Function and Friend Classes
Week 4	➤ Inheritance • Base and Derived Class • Derived Class Declaration • Inheritance and derived classes
Week 5	➤ Aggregation
Week 6	➤ Method Overloading
Week 7	➤ Method Overriding
Week 8	➤ Polymorphism and Dynamic Binding • Types of polymorphism , Need of Virtual Function • Pointer to Derived Class • Definition of Virtual Functions • Array of Pointers to Base Class ➤ Pure Virtual functions and Abstract Class
Week 9	➤ Covariant Return ➤ super Keyword
Week 10	➤ Static and Dynamic Binding
Week 11	➤ Encapsulation
Week 12	➤ Access Modifiers
Week 13	➤ Inner Classes (Nested Classes)
Week 14	➤ Templates • Function Template • Overloading Function Template • Class Template ○ Function Definition of Class Template



	○ Default Arguments with Class Template ➤ Derived Class Template
Week 15	➤ Mid Term Exam and Preparatory Week
Week 16	➤ Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	➤ Introduction to Object-Oriented Programming ➤ Java Introduction: Concepts of Object-Oriented Programming — Object, Class, Abstraction, Encapsulation, Inheritance, Polymorphism
Week 2	• Constructor and Destructors java
Week 3	• Arrays • Collections • Lists • Sets • List vs Set • Maps
Week 4	➤ Inheritance java • Base and Derived Class • Derived Class Declaration ➤ Inheritance and derived classes
Week 5	➤ Aggregation
Week 6	➤ Method Overloading
Week 7	➤ Method Overriding
Week 8	➤ Polymorphism and Dynamic Binding • Types of polymorphism , Need of Virtual Function • Pointer to Derived Class • Definition of Virtual Functions • Array of Pointers to Base Class - Pure Virtual functions and Abstract Class
Week 9	➤ Covariant Return ➤ super Keyword
Week 10	➤ Static and Dynamic Binding
Week 11	➤ Encapsulation



Week 12	➤ Access Modifiers
Week 13	➤ Inner Classes (Nested Classes)
Week 14	➤ Templates • Function Template • Overloading Function Template • Class Template ○ Function Definition of Class Template ○ Default Arguments with Class Template ➤ Derived Class Template
Week 15	➤ Final Exam

Learning and Teaching Resources مصادر التعليم والتدريس		
	Text	Available in the Library?
Required Texts	bin Uzayr, Sufyan. <i>Mastering Java: A Beginner's Guide</i> . CRC Press, 2022.	No
Recommended Texts	Sierra, Kathy, and Bert Bates. <i>Head first java</i> . " O'Reilly Media, Inc.", 2005.	No
Websites	https://www.tpointtech.com/java-tutorial	

APPENDIX
GRADING SCHEME
مخطط الدرجات

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

Note:

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



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	English Language		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	Wu23		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	2	Semester of Delivery	2
Administering Department	Software	College	Computer science and IT
Module Leader	Hayder Okab Alwan	e-mail	h.alwan@uowasit.edu.iq
Module Leader's Acad. Title		Module Leader's Qualification	M.SC
Module Tutor	Hayder Okab Alwan	e-mail	E-mail
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	14\1\2026	Version Number	2



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 أهداف المادة الدراسية	1. Students will learn of skills for listening, Reading, and writing 2. With the end of the semester students will learn a new and helpful academic vocabularies 3. Students will learn how to give opinion about any topics. 4. Learn about model verbs, obligation, and permission. 5. The semester will also cover the listening skills to train the students to catch the main idea of any recording tube.

	6. Learn to write paragraph that contain introduction, body paragraph, and conclusion.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Enables students to meet their and academic and professional goals. 2- connect critical thinking, language skills, and learning outcomes. 3- Engage students with topics and provide a critical thinking framework.
Indicative Contents المحتويات الإرشادية	Indicative Contents for English courses vary depending on the level and focus (General, Academic, or Professional) but typically integrate four key skills- reading, writing, listening, and speaking- with language systems including grammar and vocabulary.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Increase the initiative spirit in students to speak and discussing while using other language, add more academic vocabularies, and practicing listening through the tape scripts 2- Students will learn to correct mistakes through the texts grammatically. 3- Learn to write a persuasive essay that includes reasons and examples that support the idea design by the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل		Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		



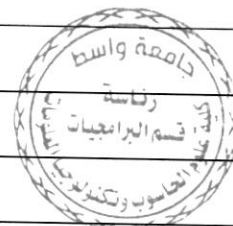
Module Evaluation تقييم المادة الدراسية				
	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome

Formative assessment	Quizzes	2	20% (20)	5 and 10	LO #1, #2 and #10, #11
	Assignments	1	5% (5)	2 and 12	LO 3-4-5-6
	Projects / Lab.	0	5% (5)	Continuous	All
	Report	1	10% (10)	13	LO #4-5-6
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1-6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Present Simple Tenses, Auxiliary verbs.
Week 2	Listening and Speaking discussion (Wounder of the modern world)
Week 3	Simple and continuous tenses
Week 4	Passive and active voice
Week 5	How to write numbers and dates.
Week 6	Reading and writing skills (The Clown Doctor)
Week 7	Past Tenses
Week 8	Art and literature (The TALE OF Gluskap and the baby)
Week 9	Reading and speaking (Pablo Picasso & Ernest Hemingway)
Week 10	Model Verbs
Week 11	Obligation and permission
Week 12	Requests and offers
Week 13	Future forms
Week 14	The Weather
Week 15	Discussing grammar
Week 16	Final Exam
Learning and Teaching Resources	



مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1- Essential academic writing 2- skills for success 1,2,3,4, reading and writing skills	
Recommended Texts	Grammar in context 1,2,3	
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	اللغة العربية 2		Module Delivery	
Module Type	Basic		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	WU21			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	2	Semester of Delivery		2
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	زهراء رحيم مسير		e-mail	zahraa.masir@uowasit.edu.iq
Module Leader's Acad. Title	مدرس مساعد		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			Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives	التعرف على قواعد اللغة العربية وآدابها 

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	بنهاية الفصل الدراسي يُتوقع من الطالب أن يكون قادرًا على: استخدام اللغة العربية الفصحى استخدامًا سليمًا في التواصل الشفهي والكتابي داخل البيئة الجامعية. تطبيق القواعد النحوية الأساسية في كتابة التقارير والواجبات الأكاديمية. تجنب الأخطاء اللغوية الشائعة في الكتابة العلمية والإدارية. قراءة النصوص العربية قراءة واعية وفهم مضامينها الرئيسية. توظيف علامات الترقيم وقواعد الإملاء توظيفًا صحيحًا في الكتابة. صياغة فقرات علمية واضحة ومتراصة تعكس القدرة على التعبير الدقيق. إدراك أهمية اللغة العربية في بناء الهوية العلمية والثقافية وتعزيز مهارات التواصل المهني.
Indicative Contents المحتويات الإرشادية	تتضمن المادة المحاور الآتية: مبادئ في الجملة الاسمية (المبتدأ والخبر). مبادئ في الجملة الفعلية (الفعل، الفاعل، نائب الفاعل). النواسخ (كان وأخواتها، إن وأخواتها) بصورة مبسطة تطبيقية. الممنوع من الصرف (مفاهيم أساسية). الحروف الشمسية والقمرية وقواعد النطق السليم. قواعد الإملاء الأساسية وعلامات الترقيم. مهارات كتابة التقرير والملخص الأكاديمي. نماذج تطبيقية من نصوص علمية مبسطة.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- استراتيجية المحاضرة التفاعلية يتم تقديم المفاهيم الأساسية بأسلوب واضح، مع إشراك الطلبة من خلال الأسئلة والمناقشات القصيرة، بما يساهم في زيادة الفهم وترسيخ المعلومات. 2- استراتيجية المناقشة والحوار تشجيع الطلبة على المشاركة الفاعلة في تحليل النصوص اللغوية والأدبية، وإبداء الرأي، مما ينمي مهارات التفكير النقدي والتعبير الشفهي. 3- استراتيجية التعلم التعاوني تقسيم الطلبة إلى مجموعات صغيرة للعمل على تحليل نص، أو استخراج ظاهرة لغوية، بما يعزز روح العمل الجماعي وتبادل الخبرات. 4- استراتيجية حل المشكلات توظيف القضايا اللغوية (النحو، الإملاء، الأسلوب) كمشكلات تعليمية، يُطلب من الطلبة تحليلها والوصول إلى الحلول المناسبة. 5- استراتيجية التطبيق العملي تدريب الطلبة على الإعراب، والكتابة السليمة، وتحليل النصوص من خلال تمارين وأنشطة تطبيقية داخل القاعة الدراسية. 6- استراتيجية التعلم القائم على الأمثلة توضيح القواعد والمفاهيم اللغوية من خلال أمثلة متنوعة مأخوذة من القرآن الكريم، والنصوص الأدبية، واللغة اليومية. 7- استراتيجية التعلم الذاتي تكليف الطلبة بواجبات قرائية أو كتابية، وتحفيزهم على الرجوع إلى المصادر اللغوية لتعزيز الاستقلالية في التعلم. 8- استراتيجية التقويم المستمر

	اعتماد الأسئلة الشفوية، والاختبارات القصيرة، والأنشطة الصفية لمتابعة مستوى الطلبة وتحديد مواطن القوة والضعف، فضلاً عن الواجبات المنزلية، والامتحانات اليومية المفاجئة، والامتحانات الشهرية، والتقارير الشهرية، والامتحانات النصف فصلية.
	9- الاهداف الوجدانية والقيمية
	الانتباه على المحاضرة، والمشاركة في المحاضرة، وتقبل المحاضرة، والرغبة في استمرار المحاضرة

Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا			
Structured SWL (h/sem)		Structured SWL (h/w)	
الحمل الدراسي المنتظم للطلاب خلال الفصل		الحمل الدراسي المنتظم للطلاب أسبوعيا	
Unstructured SWL (h/sem)		Unstructured SWL (h/w)	
الحمل الدراسي غير المنتظم للطلاب خلال الفصل		الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Total SWL (h/sem)	200		
الحمل الدراسي الكلي للطلاب خلال الفصل			

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	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
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)		
المنهاج الاسبوعي النظري		
	Material Covered	
Week 1		المبتدأ
Week 2		الخبر
Week 3		الفاعل

Week 4	نائب الفاعل
Week 5	اسم كان وأخواتها
Week 6	امتحان شهري
Week 7	خبر أن وأخواتها
Week 8	امتحان مد
Week 9	الأدب في عصر صدر الاسلام
Week 10	خطبة الرسول في حجة الوداع
Week 11	الحروف الشمسية والقمرية
Week 12	علامات الترقيم
Week 13	امتحان شهري
Week 14	مناقشة تقارير
Week 15	مناقشة تقارير

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	



Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	جامع الدروس العربية/ مصطفى غلاييني التطبيق النحوي/ عبدة الراجحي	Yes
Recommended Texts		No
Websites		

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



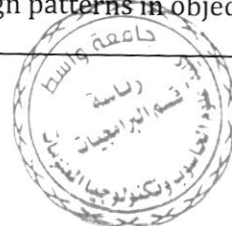
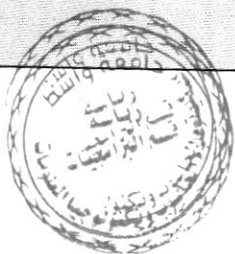
MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Software Pattern Design		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	soft-322		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	2
Administering Department	Software	College	Computer science and IT
Module Leader	Ali Fahem Neamah	e-mail	Afahim@uowasit.edu.iq
Module Leader's Acad. Title		Module Leader's Qualification	M.SC
Module Tutor	Ali Fahem Neamah	e-mail	E-mail
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date		Version Number	

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 أهداف المادة الدراسية	1. Understand the fundamental concepts of software design patterns and their role in building reusable, maintainable software 2. Classify and apply creational, structural, and behavioral design patterns (GoF patterns) in software development 3. Apply SOLID principles and their relationship with design patterns in object-oriented systems



	4. Design and implement software solutions using architectural patterns such as MVC, MVP, MVVM, and Layered Architecture 5. Use UML diagrams to model and communicate design pattern solutions effectively 6. Recognize anti-patterns and refactor code to adopt appropriate design patterns 7. Evaluate and select appropriate patterns based on context, requirements, and trade-offs 8. Build a real-world software project applying multiple design patterns and architectural styles
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Identify and apply appropriate GoF design patterns (creational, structural, behavioral) to solve software design problems. 2. Design object-oriented systems using SOLID principles and recognized architectural patterns.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction to Design Patterns: History, Motivation, and the GoF Catalog. • SOLID Principles: SRP, OCP, LSP, ISP, and DIP. • Creational Patterns: Singleton, Factory Method, Abstract Factory, Builder, Prototype. • Structural Patterns: Adapter, Bridge, Composite, Decorator, Facade, Flyweight, Proxy. • Behavioral Patterns: Observer, Strategy, Command, Iterator, Template Method. Behavioral Patterns (cont.): Chain of Responsibility, Mediator, Memento, State, Visitor. Architectural Patterns: MVC, MVP, MVVM, Layered, Microservices. Anti-Patterns: Recognition, Refactoring Techniques, and Code Smells. • Pattern-Oriented Software Architecture (POSA) and Enterprise Patterns. • Applying Patterns in Real-World Projects: Case Studies and Integration.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا	
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا



Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل		Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعياً	
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (20)		
	Assignments	1	5% (5)		
	Projects / Lab.	1	5% (5)		
	Report	1	10% (10)		
Summative assessment	Midterm Exam	2hr	10% (10)		
	Final Exam	3hr	50% (50)		
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المناهج الأسبوعية النظرية	
	Material Covered
Week 1	Introduction to Design Patterns: Definition, History, and the Gang of Four (GoF)
Week 2	OOP Review and SOLID Principles: SRP, OCP, LSP, ISP, and DIP
Week 3	Creational Patterns I: Singleton, Factory Method, and Abstract Factory
Week 4	Creational Patterns II: Builder and Prototype
Week 5	Structural Patterns I: Adapter, Bridge, and Composite
Week 6	Structural Patterns II: Decorator, Facade, Flyweight, and Proxy
Week 7	Behavioral Patterns I: Observer, Strategy, and Command
Week 8	Behavioral Patterns II: Iterator, Template Method, and Chain of Responsibility
Week 9	Behavioral Patterns III: Mediator, Memento, State, and Visitor



Week 10	Architectural Patterns: MVC, MVP, MVVM, and Layered Architecture
Week 11	Enterprise and Distributed Patterns: Repository, Dependency Injection, and Service Locator
Week 12	Anti-Patterns: Recognition, Code Smells, and Refactoring Strategies
Week 13	Combining Multiple Patterns: Pattern Interaction and Composition
Week 14	Pattern-Oriented Software Architecture (POSA) and Domain-Driven Design Overview
Week 15	Case Study: End-to-End Project Applying Multiple Design Patterns and Architectural Styles
Week 16	Final Exam

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي العملي

	Material Covered
Week 1	Setting Up the Development Environment and Reviewing OOP Concepts in Java/Python
Week 2	Applying SOLID Principles: Refactoring Exercises and Code Analysis
Week 3	Implementing Creational Patterns: Singleton and Factory Method in Code
Week 4	Implementing Creational Patterns: Abstract Factory, Builder, and Prototype
Week 5	Implementing Structural Patterns: Adapter, Bridge, and Composite with UML Diagrams
Week 6	Implementing Structural Patterns: Decorator, Facade, and Proxy in Practical Scenarios
Week 7	Implementing Behavioral Patterns: Observer, Strategy, and Command Pattern
Week 8	Implementing Behavioral Patterns: Iterator, Template Method, and State
Week 9	Architectural Patterns in Practice: Building a Mini Application using MVC
Week 10	Identifying and Refactoring Anti-Patterns and Code Smells Using Automated Tools
Week 11	Combining Multiple Patterns: Building a Layered Enterprise Application
Week 12	Pattern Documentation: Writing Pattern Catalogs and Design Reports with UML
Week 13	Final Project: Design and Implement a System Using 5+ Design Patterns with Full Documentation
Week 14	Examples
Week 15	Exam

Learning and Teaching Resources

مصادر التعلم والتدريس



	Text	Available in the Library?
Required Texts	1. Gamma, E., Helm, R., Johnson, R., & Vlissides, J., "Design Patterns: Elements of Reusable Object-Oriented Software", Addison-Wesley, 1994. 2. Freeman, E., Robson, E., Bates, B., & Sierra, K., "Head First Design Patterns", 2nd Edition, O'Reilly Media, 2020. 3. Shalloway, A. & Trott, J., "Design Patterns Explained: A New Perspective on Object-Oriented Design", 2nd Edition, Addison-Wesley, 2004. 1998. 4. Martin, R. C., "Clean Code: A Handbook of Agile Software Craftsmanship", Prentice Hall, 2008.	
Recommended Texts		
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	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	Computer Networks and Communications 2		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	Soft-321		
ECTS Credits	4		
SWL (hr/sem)	115		
Module Level	3	Semester of Delivery	
Administering Department	Software Department/ SOFT	College	Computer Science and Information Technology College / CSCIT
Module Leader	Name : Ahmad Raad	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	01/02/2026	Version Number	2.0

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 أهداف المادة الدراسية	1- Deepen understanding of advanced networking concepts, including routing protocols, switching techniques, and network security mechanisms. 2- Develop practical skills in configuring, managing, and troubleshooting complex network infrastructures, focusing on scalability, performance, and security.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the module, students will be able to demonstrate an in-depth understanding of advanced networking concepts, including dynamic routing protocols, VLANs, and network security strategies. They will be able to apply these concepts to design and manage complex network infrastructures, configure and troubleshoot routers and switches, and implement security measures to protect network environments.
Indicative Contents المحتويات الإرشادية	Indicative contents for the Computer Networking 2 module include advanced networking concepts, such as dynamic routing protocols (OSPF, EIGRP, BGP), VLANs, and inter-VLAN routing. The module covers network security topics including firewalls, VPNs, and access control lists (ACLs). It also focuses on network troubleshooting, diagnostics, and performance optimization, along with Quality of Service (QoS) techniques. Practical sessions involve configuring routers, switches, and securing network infrastructures, with case studies on modern networking applications and future trends.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategies for delivering the Computer Networking 2 module include a strong focus on practical, hands-on learning through lab-based exercises that simulate real-world networking scenarios. Lectures will cover advanced networking theories and concepts, followed by lab sessions to reinforce these ideas through direct application. Case studies and real-life examples will be used to illustrate complex topics like routing protocols and network security. Collaborative projects will encourage teamwork, while regular feedback and troubleshooting sessions will help students refine their skills and address challenges.
-------------------	--



Student Workload (SWL)

الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل		Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل		Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل			

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	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
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Material Covered	
-------------------------	--



Week 1	Explore the Network – Introduction to networking concepts, devices, and topology.
Week 2	Explore the Network – Continue exploring network infrastructures and network types.
Week 3	Configure a Network Operating System – Basic configurations on routers and switches.
Week 4	Configure a Network Operating System – Advanced configurations and initial network setup.
Week 5	Network Protocols and Communications – Understand protocols and how devices communicate.
Week 6	Network Access – Introduction to the OSI model, MAC addresses, and access methods.
Week 7	Mid-term Exam
Week 8	Network Access – Further exploration of network media, hardware addressing, and media access control.
Week 9	Ethernet – Study Ethernet technologies and standards, and how Ethernet frames function in a network.
Week 10	Network Layer – Introduction to network layer functionality, IP addressing basics.
Week 11	IP Addressing – Learn about IPv4 addressing, private vs public IP, and subnetting concepts.
Week 12	Subnetting IP Networks – Practice subnetting IP networks and efficient address assignment.
Week 13	Transport Layer and Application Layer – Explore the function of the transport layer, TCP vs UDP, and application layer protocols.
Week 14	Build a Small Network – Design and build a functioning small network using learned configurations.
Week 15	Preparatory week before the final exam – Review all concepts, focus on areas of difficulty, and prepare for the final assessment.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to Packet Tracer Program
Week 2	Switch & Router Configuration



Week 3	Router Configuration for Networks	
Week 4	Further practice with routing, including dynamic routing protocols setup.	
Week 5	Address Resolution Protocol (ARP)	
Week 6	Reverse Address Resolution Protocol (RARP)	
Week 7	Mid-term Exam	
Week 8	Configure DNS to resolve domain names to IP addresses, ensuring name-to-address mappings in a network	
Week 9	Explore advanced DHCP settings and DHCP lease management for network devices.	bles, s
Week 10	Configure VLANs on switches to segment network traffic and enhance security within a network.	
Week 11	Distance Vector Routing Protocol Configuration	
Week 12	Further practice and troubleshooting with RIP, improving network routing performance.	
Week 13	Configure link state routing protocols, focusing on OSPF for optimized network routing.	
Week 14	Final Project Implementation	
Week 15	Project Presentations and Review	

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Computer Networks" by Andrew S. Tanenbaum, 6th Edition, 2021	Yes
Recommended Texts	Routing and Switching Essentials" by Cisco Networking Academy, 2nd Edition, 2020	yes
Websites		

Grading Scheme



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



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Algorithms Design and Analysis 2		Module Delivery
Module Type	CORE		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	Soft-322		
ECTS Credits	5		
SWL (hr/sem)	135		
Module Level	3	Semester of Delivery	
Administering Department	Department of software	College	Computer Science & IT
Module Leader	Maryam jawad kadhim alwan	e-mail	mjawad@uowasit.edu.iq
Module Leader's Acad. Title	Assistant lecture	Module Leader's Qualification	Msc
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	1/2/2026	Version Number	1.0

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



Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Strengthen students' ability to apply algorithms in practical programming contexts. Develop skills in recursive and iterative problem-solving. Train students to design, analyze, and implement advanced algorithms (sorting, searching, graph algorithms, greedy methods, dynamic programming). Enhance proficiency in pseudocode writing and C++ implementation. Build capacity for evaluating algorithm efficiency using time complexity analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Implement recursive and iterative solutions (e.g., factorial). 2. Write pseudocode and translate it into C++ code for various algorithms. 3. Apply Huffman coding, Merge Sort, Quick Sort, and other sorting/searching techniques. 4. Analyze algorithm efficiency using time complexity. 5. Solve optimization problems using Dynamic Programming (e.g., Knapsack). 6. Apply Greedy algorithms (e.g., Activity Selection). 7. Implement graph algorithms such as Dijkstra's shortest path. 8. Work with Heap data structures and perform heap operations. 9. Prepare structured reports documenting algorithm design, pseudocode, and implementation.
Indicative Contents المحتويات الإرشادية	1. Introduction to Algorithms How to use algorithms 2. Factorial (Recursive & Iterative) 3. Data Compression and Sorting 3. Huffman Algorithm (pseudocode & C++ code) 4. Merge Sort (pseudocode & C++ code) 4. Mathematical Algorithms 5. GCD Algorithm Time complexity analysis Pseudocode for the GCD algorithm 6. Graph Algorithms Dijkstra's Algorithm (pseudocode & C++ code) 7. Exam (Midterm 1) 7. Optimization Problems 8. Knapsack Problem 9. Dynamic Programming table Pseudocode for each algorithm 10. Exam (Midterm 2) 11. Greedy Algorithms Activity Selection Problem (pseudocode & C++ code) 12. Heap Data Structures Max Heap Heapify Operation 13. Dynamic Programming Methods 14. Pseudocode & C++ code Final Report / Project



Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Problem Identification and Digital Mapping Guide students to recognize problems in the real world and translate them into digital solutions using algorithmic thinking. Active Participation and Continuous Engagement Encourage daily student participation in discussions, problem-solving, and short assessments. Develop self-learning skills by fostering dialogue, evaluating comprehension, and connecting lecture content with practical exercises. Assess listening, following instructions, speaking, and reading from approved references. Modern Instructional Methods Adopt innovative approaches in presenting course material. Structure content in a sequential and accessible manner, enabling students to easily revisit topics and follow logical progression
------------	--

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل		Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل		Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	200		



Module Evaluation

تقييم المادة الدراسية

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

Total assessment	100% (100 Marks)		
------------------	------------------	--	--

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	How to Use Algorithms
Week 2	Huffman Algorithm – pseudocode & C++ implementation
Week 3	Merge Sort – pseudocode & C++ implementation
Week 4	GCD Algorithm – time complexity + pseudocode in C++
Week 5	Dijkstra's Algorithm – pseudocode & C++ implementation
Week 6	Knapsack Problem – Dynamic Programming table + pseudocode
Week 7	Exam
Week 8	Greedy Algorithms – Activity Selection Problem (pseudocode & C++)
Week 9	Heap Data Structure – Max Heap & Heapify Operation
Week 10	Dynamic Programming Method – pseudocode & C++ implementation
Week 11	Exam (covers Weeks 7–10)
Week 12	Factorial (Recursive & Iterative)
Week 13	Max Heap & Min Heap with (Tree Method)
Week 14	Bellman-for
Week 15	Final project/report preparation and submission
Week 16	report preparation and submission

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Write a simple algorithm (find the maximum element in an array)
Week 2	Factorial (Recursive & Iterative) – C++ implementation
Week 3	Huffman Algorithm – C++ implementation
Week 4	Merge Sort – C++ implementation
Week 5	GCD Algorithm – Time complexity analysis + C++ implementation
Week 6	Dijkstra's Algorithm – C++ implementation
Week 7	Exam: Practical test covering Weeks 1–6.
Week 8	Knapsack Problem – Dynamic Programming table + C++ implementation



Week 9	Greedy Algorithms – Activity Selection Problem – C++ implementation
Week 10	Heap Data Structure – Max Heap & Heapify Operation
Week 11	Exam: Practical test on searching and sorting algorithms.
Week 12	Dynamic Programming Method – C++ implementation
Week 13	Min Heap & Max Heap (Tree Method)
Week 14	Bellman-Ford Algorithm – C++ implementation
Week 15	Final Project / Report Preparation & Submission

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Udemy learning C++ programming	Yes
Recommended Texts	The Design and Analysis of Algorithms -Anany Levitin -Third Edition	No
Websites	1. www.w3schools.com 2. https://academy.hsoub.com/programming/cpp	

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	Mobile Application Programming 1		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	Soft-326			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	3	Semester of Delivery		2
Administering Department	SW	College		
Module Leader	Hasan Mohammed Idan		e-mail	hidan@uowasit.edu.iq
Module Leader's Acad. Title	Assistant lecture		Module Leader's Qualification	MSc
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date		Version Number	1.0	

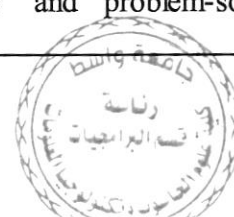
Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Understand principles and best practices of mobile application development using flutter framework
Module Learning Outcomes	Upon completion of this course, students should be able to Understand the fundamentals of the Flutter framework



مخرجات التعلم للمادة الدراسية	• Incorporate widgets and state into your app • Use Flutter's tools to enhance your development process • Customize your app with Material Design, themes, assets, and more • Make your app interactive with text input, gestures, and more • Retrieve local and real-time data from the web • Use location services • Test mobile application • Familiarize themselves with best practices of mobile application development • Develop multimedia applications in Android
Indicative Contents المحتويات الإرشادية	This module introduces students to mobile application development using Flutter and Dart. The indicative content includes: • Introduction to Mobile Application Development, mobile operating systems, platforms, and development tools • Overview of Flutter framework, its architecture, and UI concepts • Fundamentals of Dart programming language including data types, control flow, functions, object-oriented concepts, and asynchronous programming • Structure of Flutter applications and understanding widgets (Stateless and Stateful) • Widget lifecycle, widget tree, and common UI components • Layout design and building responsive and complex user interfaces • Navigation and routing in mobile applications • State management techniques in Flutter • Scrolling mechanisms and performance optimization • Implementing animations, theming, and responsive design • Local storage techniques including Shared Preferences and file storage • Database integration using SQLite and CRUD operations • Backend integration using Firebase and Firestore • Location services and maps integration • Testing and publishing mobile applications

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The module will be delivered through a combination of theoretical and practical approaches to ensure effective learning outcomes. The strategies include: • Lectures to introduce fundamental concepts of mobile application development, Flutter, and Dart • Hands-on laboratory sessions to provide practical experience in building mobile applications • Demonstrations of tools such as Android Studio and Flutter framework • Guided exercises to reinforce programming concepts and UI design skills • Project-based learning where students develop complete mobile applications • Collaborative learning through discussions and problem-solving activities

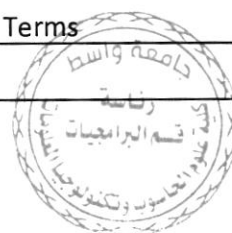


	• Self-directed learning supported by additional resources and practice tasks • Formative assessments such as quizzes and lab tasks to monitor progress • Summative assessment through midterm exam and final project evaluation
--	---

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	1230	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	82
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	495	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	33
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week1	Introduction to Mobile Application Development Mobile OS Overview, Platforms, Types of Apps, Mobile Frameworks, Development Tools, Why Flutter & Dart, Key Terms, Android Studio Environment
Week2	Introduction to Basic Flutter Introduction to Flutter, History, Flutter UI Concept, Flutter Architecture, Key Terms
Week3	Basics of Dart



	Keywords, built-in types, functions, operators, control flow statements, exceptions, classes, generics, libraries and visibility, asynchrony support, generators, callable classes, isolates, typedefs, metadata, comments
Week4	Flutter App Structure & Widgets Flutter App Structure, Introduction to Widgets, Build Method Stateless vs Stateful Widgets, Understanding Widget Lifecycle, Understanding Widget Tree & Element Tree, Some Important/Common Widgets such as AppBar, Column, Row, Container, Image, Icon, Buttons, Text, etc;
Week5	Flutter Layout Concepts Layout Widgets, Building Layouts, Handling Gestures, Building Complex UI
Week6	MID TERM
Week7	Navigation and Routing
Week8	State Management
Week9	Flutter Scrolling Scroll Views, Pagination, Performance Optimization
Week10	Animations in Flutter UI Animation, Theming, and Responsive Design
Week11	Local Storage Concepts Shared Preferences File Storage
Week12	SQLite Database (Local database) CRUD Operations
Week13	Firebase Adding Firebase & Firestore Backend Adding State Management using Firebase
Week14	Location Services Working with Location and Maps
Week15	App Testing & Publishing

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week1	Setting up a development environment for flutter and dart for a hello world example
Week2	Building a simple dart program to learn the basics Write Dart programs with asynchronous functionality and nullability
Week3	Building first Flutter application and understanding stateless and stateful widgets
Week4	Building application to use Common Widgets
Week5	Building Layouts for rich application interfaces
Week6	MID TERM
Week7	Building Navigation in applications
Week8	Building Applications with State Management.
Week9	Building widget trees and creating complex Mobile applications
Week10	Building applications with animations and transitions



Week11	Building Flutter applications that require asynchronous functionality
Week12	Building applications that require CRUD tasks and communication with the Internet
Week13	Adding support for remote storage and databases using firebase
Week14	Building Flutter applications with Location Services and Maps Integration
Week15	Project Evaluation

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	❖ Flutter Apprentice By Michael Katz, Kevin David Moore & Vincent Ngo ❖ Beginning Flutter: A Hands On Guide to App Development 1st Edition by Marco L. Napoli ❖ Flutter for Beginners: An introductory guide to building cross-platform mobile applications with Flutter and Dart 2 by Alessandro Biesek ❖ Flutter Complete Reference by Alberto Miola	NO
Recommended Texts	❖ Learn Google Flutter Fast: 65 Example Apps by mark clow	No
Websites	https://docs.flutter.dev/ https://zapp.run/	

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	Machine Learning		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	Soft-324		
ECTS Credits	5		
SWL (hr/sem)	135		
Module Level	3	Semester of Delivery	
Administering Department	Software Department/ SOFT	College	Computer Science and Information Technology College / CSCIT
Module Leader	Zhraa mahadi	e-mail	zmahadi@uowasit.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/02/2026	Version Number	2.0

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 أهداف المادة الدراسية	The primary objective of the Machine Learning module is to provide students with a comprehensive understanding of the foundational concepts, techniques, and algorithms that underpin machine learning. Students will explore various machine learning paradigms, including supervised, unsupervised, and reinforcement learning, and gain insight into the practical applications of these methods in real-world scenarios. Through hands-on experience and theoretical study, students will develop the skills necessary to preprocess data, implement machine learning algorithms, and evaluate model performance effectively.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the module, students will be able to apply various machine learning techniques to solve real-world problems, demonstrating proficiency in data preprocessing, model training, and evaluation. They will have a solid understanding of core concepts, including linear regression, classification algorithms, neural networks, and ensemble methods. Additionally, students will be equipped to critically assess the ethical implications of machine learning applications, ensuring that their practices promote fairness and transparency. Through collaborative projects, students will also enhance their teamwork and communication skills, preparing them for future challenges in the field of data science and artificial intelligence.
Indicative Contents المحتويات الإرشادية	The course will cover a range of topics essential to mastering machine learning, beginning with an introduction to the fundamental principles and types of machine learning. Students will learn about data preprocessing techniques, such as normalization and splitting datasets, and delve into supervised learning algorithms, including linear regression and decision trees. Unsupervised learning methods, such as clustering and dimensionality reduction, will also be explored. Furthermore, the course will introduce deep learning concepts, focusing on neural networks and their applications in fields like natural language processing and image recognition. Throughout the course, students will engage in practical exercises and projects to apply their learning and develop a robust understanding of machine learning methodologies.



Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The delivery of the Machine Learning module will employ a blended learning approach that combines theoretical instruction with hands-on practical experience. Lectures will introduce key concepts and frameworks, supplemented by multimedia resources such as videos and interactive presentations to cater to diverse learning styles. Practical sessions will utilize programming environments and tools like Python,
-------------------	--

	TensorFlow, and Scikit-learn to enable students to implement algorithms and analyze real datasets. Collaborative projects and group discussions will encourage peer learning and knowledge sharing, fostering a supportive learning environment. Additionally, regular assessments, including quizzes, assignments, and a mid-term exam, will provide students with feedback on their progress and understanding, ensuring they are well-prepared for the final project and overall course objectives. By integrating various teaching methods and fostering an interactive classroom atmosphere, the course aims to engage students actively and deepen their understanding of machine learning principles and practices.
--	---

Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا			
Structured SWL (h/sem)		Structured SWL (h/w)	
الحمل الدراسي المنتظم للطلاب خلال الفصل		الحمل الدراسي المنتظم للطلاب أسبوعيا	
Unstructured SWL (h/sem)		Unstructured SWL (h/w)	
الحمل الدراسي غير المنتظم للطلاب خلال الفصل		الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Total SWL (h/sem)			
الحمل الدراسي الكلي للطلاب خلال الفصل			

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	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
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All



Total assessment	100% (100 Marks)		
------------------	------------------	--	--

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Machine Learning concepts, types (supervised, unsupervised, reinforcement learning), and applications
Week 2	Data preprocessing techniques: cleaning, normalization, transformation, and splitting datasets
Week 3	Linear Regression: loss functions, gradient descent, and model evaluation metrics
Week 4	Classification Algorithms: logistic regression, k-nearest neighbors (KNN), and support vector machines (SVM)
Week 5	Decision Trees and Ensemble Methods: understanding decision trees, random forests, and boosting methods
Week 6	Neural Networks: basics, activation functions, feedforward networks, and backpropagation
Week 7	Mid-term Exam
Week 8	Unsupervised Learning: clustering algorithms (k-means, hierarchical clustering) and dimensionality reduction techniques (PCA, t-SNE)
Week 9	Natural Language Processing (NLP): text preprocessing, bag-of-words, and TF-IDF
Week 10	Model Evaluation and Hyperparameter Tuning: cross-validation, confusion matrix, and tuning methods
Week 11	Deep Learning: introduction to convolutional neural networks (CNNs) and recurrent neural networks (RNNs)
Week 12	Time Series Analysis: forecasting techniques, ARIMA models, and applications
Week 13	Ethical Considerations in Machine Learning: bias, fairness, transparency, and ethical implications
Week 14	Deployment of Machine Learning Models: techniques for deploying models, versioning, and performance monitoring



Week 15	Final Project Presentations: showcasing student projects and practical applications of machine learning concepts
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Implement data preprocessing techniques to clean and normalize datasets, including handling missing values and categorical encoding.
Week 2	Implement linear regression from scratch, using gradient descent to minimize the loss function and evaluate model performance using metrics like Mean Squared Error (MSE).
Week 3	Implement classification algorithms , including logistic regression and k-nearest neighbors (KNN), and analyze their performance using confusion matrices and accuracy scores.
Week 4	Implement decision trees and random forests , visualizing the tree structure while comparing their accuracy and overfitting tendencies.
Week 5	Implement a simple neural network using frameworks like TensorFlow or PyTorch, exploring the effects of different activation functions and architectures.
Week 6	Mid-term Exam.
Week 7	Implement unsupervised learning algorithms , including k-means clustering and hierarchical clustering, and visualize the results with appropriate plots.
Week 8	Implement dimensionality reduction techniques such as Principal Component Analysis (PCA) and t-Distributed Stochastic Neighbor Embedding (t-SNE) for visualization of high-dimensional data.
Week 9	Implement natural language processing techniques , including tokenization, stemming, and TF-IDF vectorization for text classification.
Week 10	Implement model evaluation techniques , including k-fold cross-validation and hyperparameter tuning using grid search or random search.
Week 11	Implement deep learning architectures such as convolutional neural networks (CNNs) for image classification tasks and analyze performance metrics like accuracy and F1-score.



Week 12	Implement time series analysis using ARIMA models for forecasting and evaluate the model's predictions against test data.
Week 13	Implement ethical considerations in machine learning projects , focusing on bias detection and mitigation strategies.
Week 14	Implement transfer learning by using pre-trained models for specific tasks and comparing their performance to models trained from scratch.
Week 15	Implement a final project where students apply machine learning techniques to a real-world dataset, demonstrating their understanding of the concepts learned throughout the course.

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1. K. Murphy, Machine Learning: a Probabilistic Perspective, MIT Press, 2012.	Yes
Recommended Texts	1. A. Smola and S.V.N. Vishwanathan, Introduction to Machine Learning, Cambridge University Press 2008. 2. Stanford University Machine Learning CS229 Lecture notes by Andrew Ng.	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	FX - Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded



(0 – 49)	F – Fail	راسب	(0-44)	Considerable amount of work required

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



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Website applications 2		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	Soft-221		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	
Administering Department	Software	College	Computer science and IT
Module Leader	Ghaith Ali Hussein Alawadi	e-mail	galawady@uowasit.edu.iq
Module Leader's Acad. Title		Module Leader's Qualification	M.SC
Module Tutor	Ghaith Ali Hussein Alawadi	e-mail	E-mail
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	15\1\2026	Version Number	2

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 أهداف المادة الدراسية	1. Understanding the fundamentals of web application design, browsers, and their types. 2. Understanding the key steps to protect web pages from various hacking attempts. 3. Students' familiarity with all the programming languages and software used to create website applications.

	4. Understanding and applying information technology concepts and types of authentication. 5. The ability to describe website design systems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Developing teaching and learning skills, enabling students to find appropriate solutions to future problems. 2. Enhancing performance skills through student participation in the lesson and brainstorming. 3. Enabling students to develop and create integrated, error-free, and risk-free website applications. 4. Acquiring programming skills and professionalism in all the necessary software for website applications, using the most cost-effective and efficient methods to achieve an ideal website.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction to website applications. • Using technology during lectures • Writing computer programs and specific algorithms for website applications. • Providing students with key and supporting vocabulary related to website application systems. • Assigning students the task of designing websites.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل		Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		



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

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Application websites
Week 2	Introduction to develop software for the Internet and web technology
Week 3	websites Architecture
Week 4	skills in dealing with web design
Week 5	HTTP and HTML
Week 6	Web Design & Development
Week 7	Setting Up a Development Server
Week 8	Introduction to PHP
Week 9	Setting Up a Local Web Server
Week 10	WHAT IS XAMPP
Week 11	USING A PROGRAM EDITOR ^ Using an IDE
Week 12	Appling Examples
Week 13	Lexical Structure PHP
Week 14	Appling Examples



Week 15	Arithmetic Operators-String Concatenation Operator and Assignment Operators
Week 16	Final Exam

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي العملي

	Material Covered
Week 1	Designing and developing interactive web pages using HTML5, CSS3, and JavaScript.
Week 2	Examples for HTML5, CSS3, and JavaScript.
Week 3	Server-side scripting
Week 4	Examples of Server-side scripting .
Week 5	Advanced programming using JavaScript, interacting with page elements (DOM Manipulation).
Week 6	Examples of (DOM Manipulation).
Week 7	Working on CSS frameworks to ensure the site is responsive (Responsive Design).
Week 8	Exam
Week 9	Introduction to server-side programming (such as PHP or Node.js)
Week 10	Examples of server to PHP or Node.js
Week 11	Dealing with forms (Forms & Validation).
Week 12	Examples of forms (Forms & Validation)
Week 13	Working with databases (SQL)
Week 14	Examples of databases (SQL)
Week 15	Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1-W3Schools 2-HTML and CSS design and build websites . 3-Responsive Web Design with HTML5 .	
Recommended Texts		
Websites	1-Website, www.php.net . 2-Website, www.w3schools.com/php . 3-Website, www.phptutorial.net . 4th Edition, Prentice Hall, 1998.	



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	Mathematics 2		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	Soft-124			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	1	Semester of Delivery		2
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	Akab Rashid		e-mail	ahameed1@uowasit.edu.iq
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	02/09/2025		Version Number	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Soft-114	Semester	1
Co-requisites module	None	Semester	



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

Module Objectives أهداف المادة الدراسية	This course studies the mathematical elements of software department Topics include propositional logic; predicate logic; mathematical reasoning; techniques of proof; mathematical induction; set theory; number theory; matrices; sequences and summations; functions, relations and their properties, elementary graph theory, and tree.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Learning outcomes are concise descriptions of what students will learn and how that learning will be assessed
Indicative Contents المحتويات الإرشادية	In general, mathematics is the study of numbers, quantities, and shapes ² . It is a subject that is used in everyday life and is essential in many careers such as engineering, science, and finance ³

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية



		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	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
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Laplace transform for standard important function
Week 2	Multiplication by tn , division by t , unit step function
Week 3	Inverse Laplace transform of derivatives
Week 4	Application of laplace transformation
Week 5	Solution of non-linear equations, Newton Raphson method for approximating, Lagrange approximation.
Week 6	Numerical differentiation and numerical integration, The Solutions of Integral equations, Trapezoidal method
Week 7	Mid-term Exam
Week 8	Simpsons method
Week 9	Fourier series for odd and even functions ,Half range Fourier sin and cosine series
Week 10	Change of interval
Week 11	Formation of Partial differential equations
Week 12	Types of partial differential equations, wave equation, heat equation
Week 13	Numerical differentiation, Euler method, modified Euler method
Week 14	Rung Kutta method, Rung Kutta- merson method
Week 15	Numerical analysis, Elimination and iterative methods
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	

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Thomas Calculus", 12thED, George B. Thomas Jr., Maurice D. Weir, Joel R. Hass, 2009 Differential Equations (Schaum's Outlin Series).	Yes
Recommended Texts	Calculus (Howard Anton).	No
Websites	Advanced Engineering Mathematics (Erwin Kreyszig)	

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

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



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	English Language 1		Module Delivery
Module Type			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	WUO2		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	Semester of Delivery	2
Administering Department	Software Department/ SOFT	College	Computer Science and Information Technology College / CSCIT
Module Leader	Name : Sara HAZIM	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	01/02/2026	Version Number	2.0

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 أهداف المادة الدراسية	Students will focus on English at a pre-intermediate level concentrating on the receptive skills of reading and listening and the productive skills of writing and speaking. These will include such things as comparatives and superlatives, quantifiers, possessive adjectives and pronouns, vocabulary building, roleplay activities for speaking, reading comprehension and writing short descriptive paragraphs.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Teaching the four English skills(reading, writing, speaking ,listening and translation)
Indicative Contents المحتويات الإرشادية	active contents in learning English refer to the factual points that candidates are expected to know and understand in order to pass an exam or course.

Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

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

Module Evaluation
تقييم المادة الدراسية



		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	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
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction computer user
Week 2	Digital camera
Week 3	Computer architecture Processor CPU
Week 4	Computer architecture Binary system
Week 5	Computer architecture Hard disk
Week 6	Computer application Speed trap
Week 7	Mid-term Exam
Week 8	Computer application ATM, Data base , barcode
Week 9	Peripheral
Week 10	Peripheral
Week 11	Former student Higer national certificated
Week 12	Former student Higer national certificated
Week 13	Operating system



Week 14	Operating system
Week 15	Graphic user interface
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Oxford English in INFORMATION TECHNOLOGH	Yes
Recommended Texts	Interchange by Jack C. Richards	yes
Websites	A junior English Grammar and Composition	

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	Digital Logic Design 2		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	Soft-123			
ECTS Credits	7			
SWL (hr/sem)	175			
Module Level	1	Semester of Delivery		2
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	Ali AbdulMuniem		e-mail	amuniem@uowasit.edu.iq
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	01/02/2026		Version Number	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Soft-113	Semester	1
Co-requisites module	None	Semester	



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	التعرف على آلية عمل البوابات المنطقية وكيفية بناء الدائرة المنطقية بعد تبسيط التعبير المنطقي وفق قوانين وضعت لهذا الغرض
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- التعرف على الصيغة الرقمية للأعداد العشرية الثمانية والسادسية 2- طرق التحويل بين الأعداد والأنظمة 3- التعرف على كيفية إجراء عمليات الضرب والجمع والقسمة بين الأعداد والأنظمة المختلفة 4- دراسة مفصلة عن البوابات المنطقية وربطها من الناحية المنطقية دراسة مفصلة عن الماسكات في الدوائر الإلكترونية والفلب فلوب
Indicative Contents المحتويات الإرشادية	The indicative contents of logic design may include the following: 1.Introduction to digital circuits and logic gates: This includes an overview of digital circuits, logic gates, Boolean algebra, and truth tables. 2.Combinational logic design: This includes designing combinational circuits using basic logic gates, Karnaugh maps, and Boolean algebra. 3.Sequential logic design: This includes designing sequential circuits using flip-flops, registers, counters, and other sequential logic components. 4.Analysis and optimization of digital circuits: This includes analyzing digital circuits using truth tables, timing diagrams, and other tools, as well as optimizing circuits for speed, power consumption, or other performance metrics. 5.Computer-aided design (CAD) tools: This includes using popular CAD tools such as Verilog, VHDL, and SPICE to simulate and validate digital circuits.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.
-------------------	--

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem)	64	Structured SWL (h/w)	7
------------------------	----	----------------------	---



الحمل الدراسي المنتظم للطلاب خلال الفصل		الحمل الدراسي المنتظم للطلاب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	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
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Combinational logic Multiplexers
Week 2	Combinational logic Multiplexers
Week 3	Combinational logic Demultiplexers
Week 4	Combinational logic Demultiplexers
Week 5	Combinational logic ROM
Week 6	Combinational logic ROM
Week 7	Mid-term Exam
Week 8	Karnaugh Map (K-M)
Week 9	Latches and Flip-flops
Week 10	SR Latch
Week 11	SR Flip-flop
Week 12	D Flip-flop



Week 13	JK Flip-flop
Week 14	T Flip-Flop
Week 15	Master- Slave JK Flip-flop
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Logic gates
Week 2	Multiplexers
Week 3	Demultiplexers
Week 4	ROM
Week 5	Simplify of logic gates
Week 6	SR Flip flop
Week 7	Mid-term Exam
Week 8	D latch
Week 9	D Flip flop
Week 10	JK flip flop connection
Week 11	T Flip flop
Week 12	Master Slave JK Flip flop
Week 13	SR Latch
Week 14	Review
Week 15	Recap
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Digital Design by M. Morris Mano Fifth edition	Yes



Recommended Texts	[1] Computer System Architecture Third Edition M. Morris Mano [2] Digital Fundamentals Eight Edition FLOYD [3] Digital Fundamentals Ninth Edition FLOYD	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	Fundamentals of Programming 2		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	Soft-122		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	1	Semester of Delivery	
Administering Department	Software Department/ SOFT	College	Computer Science and Information Technology College / CSCIT
Module Leader	Thear fraj	e-mail	thaerali@uowasit.edu.iq
Module Leader's Acad. Title	Professor	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	01/09/2025	Version Number	2.0

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 أهداف المادة الدراسية	This course aims to introduce students to fundamental concepts of object oriented programming with Java, gives an introduction to event driven programming and graphical user interface, exception handling, files manipulation and recursion. The topics covered in this course provide a foundation for more advanced courses in Computer Science and Information Systems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A. Knowledge and Understanding A1. Concepts and Theories: 1. Lists the concepts of OOP 2. Lists the concepts of Inheritance 3. Lists the concepts of GUI 4. Lists the concepts of File management and Exception handling A2. Professional Responsibility: - Abide by laws and regulations when using computer networks. B. Subject-specific skills B1. Problem solving skills: - Supply the student with the ability to solve different problems related to the topics B2. Modeling and Design: - Learn how to design a complete java project B3. Application of Methods and Tools: - Learn how to implement a complete java project C. Critical-Thinking Skills C1. Analytic skills: - Learn how to analyze a problem C2. Strategic Thinking: - Understand the required strategy to solve problems C3. Creative thinking and innovation: - Design the student's GUI according to a given problem D. General and Transferable Skills (other skills relevant to employability and personal development) D1. Communication: - Express and communicate ideas in written and oral forms. D2. Teamwork and Leadership: - Be cooperative members of a team D3. Organizational and Developmental Skills: - Plan for automating of systems D4. Ethical and Social Responsibility: - Understand that they are accountable for their actions and there must be a balance between economic growth and the welfare of the society and environment.
Indicative Contents المحتويات الإرشادية	A. Knowledge and Understanding A1. Concepts and Theories: 1. Lists the concepts of OOP 2. Lists the concepts of Inheritance 3. Lists the concepts of GUI 4. Lists the concepts of File management and Exception handling A2. Professional



	Responsibility: - Abide by laws and regulations when using computer networks. B. Subject-specific skills B1. Problem solving skills: - Supply the student with the ability to solve different problems related to the topics B2. Modeling and Design: - Learn how to design a complete java project B3. Application of Methods and Tools: - Learn how to implement a complete java project C. Critical-Thinking Skills C1. Analytic skills: - Learn how to analyze a problem C2. Strategic Thinking: - Understand the required strategy to solve problems C3. Creative thinking and innovation: - Design the student's GUI according to a given problem General and Transferable Skills (other skills relevant to employability and personal development) D1. Communication: - Express and communicate ideas in written and oral forms. D2. Teamwork and Leadership: - Be cooperative members of a team D3. Organizational and Developmental Skills: - Plan for automating of systems D4. Ethical and Social Responsibility: - Understand that they are accountable for their actions and there must be a balance between economic growth and the welfare of the society and environment.
--	---

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem)		Structured SWL (h/w)	
الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem)		Unstructured SWL (h/w)	

الحمل الدراسي غير المنتظم للطالب أسبوعيا	الحمل الدراسي غير المنتظم للطالب خلال الفصل
Total SWL (h/sem)	الحمل الدراسي الكلي للطالب خلال الفصل

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	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
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	controlling access to members, using this reference
Week 2	Composition enumerations
Week 3	Introduction, to define a function and return statement.
Week 4	garbage collection and method finalize, static class members
Week 5	Passing parameters. passing by value, passing by reference, type of functions
Week 6	final instance variables
Week 7	Mid-term Exam
Week 8	Functions and types of argument
Week 9	data abstraction and encapsulation
Week 10	sequential text files
Week 11	String , member functions of string , string liberties
Week 12	relationship between super- and sub-classes
Week 13	Structures, types of defined structures, structures with structures, array of structures



Week 14	Polymorphism – polymorphism examples
Week 15	creating and using interfaces
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	controlling access to members, using this reference
Week 2	Composition enumerations
Week 3	Introduction, to define a function and return statement.
Week 4	garbage collection and method finalize, static class members
Week 5	Passing parameters. passing by value, passing by reference, type of functions
Week 6	final instance variables
Week 7	Mid-term Exam
Week 8	Functions and types of argument
Week 9	data abstraction and encapsulation
Week 10	sequential text files
Week 11	String, member functions of string , string liberties
Week 12	relationship between super- and sub-classes
Week 13	Structures, types of defined structures, structures with structures, array of structures
Week 14	Polymorphism – polymorphism examples
Week 15	Final



Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	-Daniel Liang, 2012, Introduction to Java Programming. 9th ed. Prentice Hall	Yes

Recommended Texts	Problem Solving with Java / Koffman, Elliot B. 2nd ed Addison-Wesley, 2002, ISBN: 0- 201-72214-3	yes
Websites	Google	

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	Discrete Structure		Module Delivery
Module Type			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☒ Seminar
Module Code	Soft-125		
ECTS Credits	3		
SWL (hr/sem)	75		
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	01/09/2025	Version Number	2.0

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 أهداف المادة الدراسية	The main goal of this course is to provide students with the knowledge related to digital design, computer architecture and assembly language. Objectives: • Understand Logic gates • Design Combinational and Sequential Circuits • Write and Analyze Assembly programs
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Its emphasis is on the lower level abstraction of a computer system. Topics included: digital logic, instruction set, ALU design, memory and assembly language programming. The course offers programming practice with an assembly language to provide practical application of concepts presented in class
Indicative Contents المحتويات الإرشادية	Identify the different types of circuits. Identify the different types of registers. Relate C programs into Assembly language. Identify the different parts of a virtual memory. Identify the different encoding of information. Identify different types of overflow attacks. Subject specific skills – with ability to ... Design combinational circuits Design sequential circuits. Develop an assembly program. Analyze and Debug a C and Assembly programs.

Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	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 محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	104	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	49	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	104		



Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	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
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction , procedural
Week 2	programming principles
Week 3	Algorithms and flowcharts, properties and design
Week 4	Algorithms and flowcharts, properties and design
Week 5	C++ Language Basics (Characte set, Identifiers, keywords Variables, Constants
Week 6	C++ operators (Arithmetic Operators, Assignment operators, relational operator, comparison and logical operators, bitwise logical operators), type
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	Selection Statements (Selection Statements, The Single If Statement Structure, The Single If Statement Structure (Blocks), The If/else
Week 9	Statement Structure
Week 10	Nested If and If/else Statements, else if
Week 11	statement
Week 12	Switch
Week 13	switch, conditional statement
Week 14	loop
Week 15	Do/While Statement,
Week 16	Preparatory week before the final Exam



Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Opening the computer
Week 2	Opening the language
Week 3	Opening the language
Week 4	Character set identifiers
Week 5	Getting started with C++
Week 6	Variable declarations
Week 7	In program explain Variables constants Program of arithmetic Operations the "math.h"

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1-Fundamentals of Programming C++, Richard L. Halterman , School of Computing Southern Adventist University September 12, 2016	Yes
Recommended Texts	2- Programming Languages design and implementation, Terrenne W. Pratt ,2000.	yes
Websites		

Grading Scheme

مخطط الدرجات

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

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



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	Computer organization 2		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	Soft-221			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	2	Semester of Delivery		2
Administering Department	Software	College	Computer science and IT	
Module Leader	Ahmed Hafhd Ibrahim		e-mail	ahafidh@uowasit.edu.iq
Module Leader's Acad. Title		Module Leader's Qualification	PhD	
Module Tutor	Ahmed Hafhd Ibrahim		e-mail	ahafidh@uowasit.edu.iq
Peer Reviewer Name		e-mail	E-mail	
Scientific Committee Approval Date	15\1\2026	Version Number	2	

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

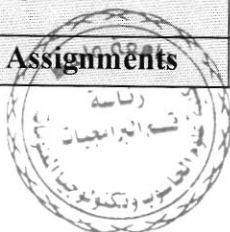
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Developing the student's ability to engage in dialogue and discussion. 2. Enhancing the student's ability to use various media effectively. 3. Teaching the essential skills that enable students to use computers. 4. Developing the student's ability to use the internet.
Module Learning Outcomes	1. Learn how to implement and use Microsoft applications.. 2. To provide a solid foundation on the fundamentals of Operating System

مخرجات التعلم للمادة الدراسية	
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. ➤ Introduction to Operating Systems. ➤ Components of an Operating System ➤ Main Types of Windows Operating Systems ➤ Functions of an Operating System

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل		Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (20)	5 and 10	LO #1, #2 and #10, #11
	Assignments	1	5% (5)	2 and 12	LO 3-4-5-6



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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Operating System
Week 2	Functions of OS
Week 3	TYPES OF OPERATING SYSTEMS
Week 4	TOP FIVE OPERATING SYSTEMS
Week 5	COMPONENTS OF AN OPERATING SYSTEM
Week 6	Windows Operating System
Week 7	Applications Software
Week 8	Introduction to PowerPoint program
Week 9	Merits of Windows OS
Week 10	Linux Operating System
Week 11	Definition of viruses in computers
Week 12	Virus prevention methods
Week 13	Excel applications
Week 14	Implement Full Program
Week 15	Final Exam

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي العملي

	Material Covered
Week 1	Introduction to Excel Microsoft Office
Week 2	Sheets and worksheets
Week 3	FORMULA with Excel Microsoft Office



Week 4	FORMULA part2
Week 5	IF condition with Excel Microsoft Office
Week 6	Page layout and data menus
Week 7	Review and view manse
Week 8	Creating database with Excel Microsoft Office
Week 9	Creating database part2
Week 10	Introduction to power point Office
Week 11	Design and transition menus
Week 12	Animation and slide show manus
Week 13	Record manus
Week 14	How to make presentation
Week 15	How to make presentation part2

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Computer Fundamentals / A textbook prescribed by the Ministry. 2. Computer Skills Book. 3. Websites.	
Recommended Texts		
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	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.

