



Ministry of Higher Education
and Scientific Research

Supervision and Scientific
Evaluation Authority

Academic Program Description
University of Hillah
College of Science
Department of Computer Science and
Information Technology

2026



University Information

University Name: University of Hillah

College/Institute: College of Science

Scientific Department: Computer Science Department

Academic or Professional Program Name: Bachelor's in Computer Science and Information Technology

Final Degree Awarded: Bachelor's in Computer Science and Information Technology

Study System: Semester-based – Bologna Process

Date of Program Description Preparation : 1/10/2025

Date of File Completion : 1/10/2025

File Reviewed by the Quality Assurance and University Performance Division

Quality Assurance and University Performance Division Head :

Date : 1/10/2025

Signature :

م. م. حسين



Dean's Approval

أ.د. أسعد صباح هادي
عميد كلية العلوم

1/10/2025

1. Vision

To be a leading college in providing high-quality education in the fields of Medical Physics, Computer Science and Information Technology, Artificial Intelligence, and Forensic Science, enhanced by innovation, technology, and pioneering scientific research to meet societal needs and contribute to scientific knowledge development.

2. Program Mission

We aim to provide advanced academic programs in Applied Medical Physics, Computer Science and Information Technology, Artificial Intelligence, and Forensic Science to prepare distinguished graduates equipped with the knowledge and skills necessary to keep pace with rapid changes in science and technology. We also strive to enhance scientific research leadership to serve society and meet its evolving needs.

Program Objectives

- -Deliver modern educational programs that cover technological and scientific advancements.
- -Prepare qualified graduates capable of applying knowledge and scientific skills in their specialized fields.
- -Enhance scientific research and innovation.
- -Develop academic programs to meet the changing job market needs in science and technology.
- - Promote community engagement and provide scientific and technological solutions to contemporary issues.

Program Accreditation

The program does not currently hold any accreditation.

External Influences

Monitoring developments in computing devices and aligning curricula with these advancements, leveraging international resources, and fulfilling labor market requirements.

Program Structure

Program Component	Courses Number of	Credit Hours	Percentage	Notes
Institutional Requirements	-	-	-	Core
College Requirements	-	-	-	Core
Department Requirements	-	-	-	Core
(Summer Training (2nd & 3rd Year	-	-	-	-
Other	-	-	-	-



Academic Program Objectives:

- The program aims to graduate professionals with the scientific and practical skills necessary to organize software operations.
- The program is designed to equip engineers with the competencies required to keep pace with rapid advancements in digital computing. It aims to provide them with the skills needed to develop and upgrade computing hardware.
- Additionally, the installation and operation of various types of electronic medical devices are essential components of the program.
- Moreover, the program contributes to and oversees the maintenance and calibration of various computing devices.
- Medical Devices:
 - The program is designed to equip students with the scientific and practical skills required to diagnose and repair device malfunctions.
 - It aims to prepare competent scientists capable of keeping up with rapid developments in computer software and equipped with the necessary skills to develop and update such programs.
 - Students will also learn how to install and operate different types of devices.
 - Additionally, students will contribute to the maintenance, calibration, and supervision of various devices.
 - Students will design, develop, and explore alternatives for some device-related components.
- Scheduling and programming routine maintenance tasks.
- Enhancing performance standards, including the application of international standards in technical education.
- Keeping up with curricular advancements.
- Strengthening connections between the department and various community sectors.
- Expanding communication and collaboration with peer scientific institutions inside and outside the country.

A. Cognitive Objectives



1. Ability to break down and analyze device components and their functions.
2. Ability to diagnose faults in hardware and software systems.
3. Ability to propose appropriate solutions for hardware issues.
4. Ability to develop suitable maintenance plans for digital programs.
5. Ability to establish and assess the appropriate conditions for each program.

B. Program Qualification Objectives

1. Train and develop technical personnel in operating and maintaining digital programs.
2. Design efficient and cost-effective computing programs.
3. Provide scientific and practical consultation in the field of computer science.

C. Teaching and Learning Methods

Theoretical lectures, practical laboratory work, scientific seminars, specialized training courses, and exhibitions in the field of computing.

D. Assessment Methods

Daily exams, semester exams, attendance records, lab reports, and annual evaluations.

E. Affective and Value-Based Objectives

1. Design high-efficiency and cost-effective computing programs.
2. Provide scientific and practical consultation.

F. Personal Development Planning

Scientific visits to specialized centers, participation in specialized exhibitions, and attending training courses organized by private sector companies.

G. Admission Criteria

1. Graduates of the sixth preparatory stage (Biological and Applied Science branches).
2. Graduates of technical institutes.



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Calculus I		Module Delivery	
Module Type	Basic		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	HUC-CSIT101			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	UGI	Semester of Delivery		1
Administering Department	CS	College	HUCCS	
Module Leader	Sami Kadhim Al-thabhwai		e-mail	sami_kadhim@hilla-unc.edu.iq
Module Leader's Acad. Title	Assist Professor		Module Leader's Qualification	MS.c
Module Tutor	Sami Kadhim Al-thabhwai		e-mail	sami_kadhim@hilla-unc.edu.iq
Peer Reviewer Name	Non		e-mail	...
Scientific Committee Approval Date	16/09/2025		Version Number	V1



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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	the course aims to give the basics of mathematics, study mathematical functions, their properties, and their graphics. It also studies inverse functions and methods of finding them, with calculating the ends and continuities of all types of these functions, and using some theorems related to the subject.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A- Cognitive goals A1- Know the basic concepts of mathematics A2- Knowing the properties of functions and their graphics A3- Knowing how to prove continuity of functions A 4- Knowing the types of mathematical functions and ways to solve them B - The soft skills objectives of the course. B1 - Students' knowledge of the basics of mathematics B2 - How to solve and draw mathematical functions
Indicative Contents المحتويات الإرشادية	Knowing the basics of mathematics, which are necessary for every student, and teaching them to benefit from what they have studied in the service of their country, as well as gaining students the ethics of their scientific specialization. • Mathematics basics (20 hrs) • Types of mathematical functions (40 hrs) • Trigonometric functions and their inverses (40 hrs) • The limit (20 hrs)



Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The lecturer's strategy is to give lectures and conduct short tests with the adoption of giving open assignments and grades as encouragement to students.
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Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem)	45	Structured SWL (h/w)	3
الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem)	75	Unstructured SWL (h/w)	5
الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem)	120		
الحمل الدراسي الكلي للطالب خلال الفصل			

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2hr	30	5 , 10	
	Assignments	2hr	10	every 3 weeks	
	Projects / Pr.				
	Seminar				
Summative assessment	Midterm Exam	2hr	10% (10)	11	
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Mathematics basics
Week 2	Sets (natural, integer, relative, ...)
Week 3	Operations on the sets



Week 4	Intervals , Inequalities and Absolute values
Week 5	Slope and Equation of a Straight
Week 6	First exam
Week 7	the circle equation , Types of mathematical functions
Week 8	Functions of all type and graphics
Week 9	Inverse functions
Week 10	Trigonometric functions and their inverses
Week 11	Second exam
Week 12	Exponential and logarithmic functions ,The limits
Week 13	The sandwich theorem
Week 14	The Intermediate value theorem
Week 15	Continuity
Week 16	

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Calculus. Thomas. book	
Recommended Texts	1- Calculus I .paul Dawkins book 2- All mathematics books are useful for this subject	
Websites		



Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group	A - Excellent	امتياز	90 - 100	Outstanding Performance

(50 - 100)	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 Skills		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☒ Seminar
Module Code	HUC-CS103		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGI	Semester of Delivery	
Administering Department	HUC.CS	College	College of science
Module Leader	Ashraf Farhan Hatem	e-mail	ashraffarhan226@hilla-unc.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.S.c
Module Tutor	Ashraf Farhan Hatem	e-mail	ashraffarhan226@hilla-unc.edu.iq
Peer Reviewer Name	Non	e-mail	...
Scientific Committee Approval Date	16/09/2025	Version Number	V1



Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CS101	Semester	1
Co-requisites module	Non	Semester	...

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Identify the components and function of the hardware used in a computer system. 2. Describe the function of system software. 3. Describe the function of application software. 4. List the steps in systems analysis and design. 5. Describe the popular programming languages and the process of developing computer software.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	At the end of the course the student would: 1. Ability to understand the basic structure of computers. 2. Ability to perform computer arithmetic operations. 3. Ability to understand control unit operations. 4. Ability to understand the concept of cache mapping techniques. 5. Ability to understand the concept of I/O organization. 6. Ability to conceptualize instruction level parallelism
 Indicative Contents المحتويات الإرشادية	Part I: Introduction to Basics of Operating System (40 hrs.) - types of language programming - Concept of computing, data and information - types of system software Part II: Basic of Computer Networks (35) - Concept of Internet - Basics of E-mail - Instant Messaging and Collaboration part III: General concepts Operating systems (35 hrs.) - system booting - cache memory organization - storage management - function of BIOS part IV: Introduction to Internet, WWW and web browsers Communications and Collaboration (25 hrs.) - Knowing computer - Operating Computer using GUI Based Operating System - Understanding Word Processing - Using Spreadsheet - Making small presentation - Creating Presentation; Preparation and Presentation of Slides - Taking printouts of presentation / handouts

part V: Concept of Internet (10)

- Applications of Internet
- Connecting to the Internet

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

Throughout the module, it is important to employ effective learning and teaching strategies to ensure students grasp the concepts and develop the necessary skills. The main strategy that will be adopted in delivering this module:

Giving lectures.

Practical Exercises within the laboratories: Provide students with opportunities to practice their skills through practical exercises.

Conducting theoretical exams.

Request a report from students to teach them how to do research on a specific topic.

Request some small projects from student groups of real-world examples and case studies to demonstrate the relevance



Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	85	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	145		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3 and 9	CL: 2,3 and 8,9
	Assignments	2	5% (5)	5 and 12	CL: 5 and 11

	Projects / Lab.	1	10% (10)	Continuous	All
	Projects / Pr.	2	10% (10)	5 and 13	CL: 4,5 and 12, 13
	Seminar	1	5% (5)	14	CL: 7, 10, 13
Summative assessment	Midterm Exam	2hr	10% (10)	6	CL: 1 - 5
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Basics of Operating System
Week 2	types of language programming
Week 3	Concept of computing, data and information
Week 4	types of system software
Week 5	Exam1
Week 6	Basic of Computer Networks
Week 7	Concept of Internet
Week 8	Basics of E-mail
Week 9	Instant Messaging and Collaboration
Week 10	Exam2
Week 11	system booting
Week 12	cache memory organization
Week 13	storage mangment
Week 14	function of BIOS
Week 15	Exam3
Week 16	Preparatory week before the final Exam



Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Knowing computer
Week 2	Operating Computer using GUI Based Operating System

Week 3	Understanding Word Processing
Week 4	Using Spreadsheet
Week 5	Exam1
Week 6	Introduction to Internet, WWW and web browsers
Week 7	Communications and Collaboration
Week 8	Making small presentation
Week 9	Creating Presentation; Preparation and Presentation of Slides
Week 10	Taking printouts of presentation / handouts
Week 11	Exam2
Week 12	Concept of Internet
Week 13	Applications of Internet
Week 14	Connecting to the Internet
Week 15	Exam3



Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Computer Organization – Car Hamacher, Zvonks Vranesic, Safea Zaky, Vth Edition, McGraw Hill. 2. Computer	
Recommended Texts	Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI. 3. Structured Computer Organization – Andrew S. Tanenbaum, 4th Edition, PHI/Pearson.	
Websites	https://www.tutorialspoint.com/computer_organization/index.asp	

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		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☒ Seminar
Module Code	HUC-CS101		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	UGI	Semester of Delivery	
Administering Department	CS	College	HUCCS
Module Leader	Hadeel Talib Mangi	e-mail	hadeel_talib@hilla-unc.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.S.c.
Module Tutor	Hadeel Talib Mangi	e-mail	hadeel_talib@hilla-unc.edu.iq
Peer Reviewer Name	Non	e-mail	...
Scientific Committee Approval Date	16/09/2025	Version Number	V1



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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1 The purpose of the course is to introduce principles of computer organization and the basic architectural concepts. 2 It begins with basic organization, design, and programming of a simple digital computer and introduces simple register transfer language to specify various computer operations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	On completion of the course, student will be able to : 1. Demonstrate computer architecture concepts related to design of modern processors, memories and I/Os. 2. Analyze the performance of commercially available computers. 3. To develop logic for assembly language programming
Indicative Contents المحتويات الإرشادية	Part I: Introduction to Computer organization (45 hrs.) - Overview of computer concepts and Basic principles of computer architecture - Register Transfer Language and Micro operations - Microprogrammed Control - Central Processing Unit - Data Representation - Computer Arithmetic Part II: Input-Output Organization (45) - Memory Organization - Processor Organization - paging and segmentation - types of computers - storage devices part III: General concepts Operating systems and their types (45 hrs.) - explain Ms-Dos Instruction part 1 - explain Ms-Dos Instruction part 2 - Explanation of the Windows system part 1 - Explanation of the Windows system part 2 - Implementation and explanation of the application of the Microsoft Word 1 - Implementation and explanation of the application of the Microsoft Word 2 part IV: microsoft office (35 hrs.) - Implementation and explanation of the application of the Microsoft powerpoint 1



	• Implementation and explanation of the application of the Microsoft powerpoint 2 • Implementation and explanation of the application of the Microsoft Excel 1 • Implementation and explanation of the application of the Microsoft Excel 2
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Throughout the module, it is important to employ effective learning and teaching strategies to ensure students grasp the concepts and develop the necessary skills. The main strategy that will be adopted in delivering this module: Giving lectures. Practical Exercises within the laboratories: Provide students with opportunities to practice their skills through practical exercises. Conducting theoretical exams. Request a report from students to teach them how to do research on a specific topic. Request some small projects from student groups of real-world examples and case studies to demonstrate the relevance
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	110	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	170		

Module Evaluation

تقييم المادة الدراسية

	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
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Formative assessment	Quizzes	2	10% (10)	3 and 9	CL: 2,3 and 8,9
	Assignments	2	5% (5)	5 and 12	CL: 5 and 11
	Projects / Lab.	1	10% (10)	Continuous	All
	Projects / Pr.	2	10% (10)	5 and 13	CL: 4,5 and 12, 13
	Seminar	1	5% (5)	14	CL: 7, 10, 13
Summative assessment	Midterm Exam	2hr	10% (10)	6	CL: 1 - 5
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Digital Computers
Week 2	Basic Computer Organization and Design
Week 3	Register Transfer Language and Micro operations
Week 4	Microprogrammed Control
Week 5	Central Processing Unit
Week 6	Data Representation
Week 7	Computer Arithmetic
Week 8	Exam1
Week 9	Input-Output Organization
Week 10	Memory Organization
Week 11	Processor Organization
Week 12	paging and segmentation
Week 13	types of computers
Week 14	storage devices
Week 15	Exam2
Week 16	Preparatory week before the final Exam



Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	explain Ms-Dos Instruction part 1

Week 2	explain Ms-Dos Instruction part 2
Week 3	Explanation of the Windows system part 1
Week 4	Explanation of the Windows system part 2
Week 5	Implementation and explanation of the application of the Microsoft Word 1
Week 6	Implementation and explanation of the application of the Microsoft Word 2
Week 7	Exam1
Week 8	Implementation and explanation of the application of the Microsoft powerpoint 1
Week 9	Implementation and explanation of the application of the Microsoft powerpoint 2
Week 10	Implementation and explanation of the application of the Microsoft Excel 1
Week 11	Implementation and explanation of the application of the Microsoft Excel 2
Week 12	Home Work
Week 13	Exam2
Week 14	Home Work
Week 15	Home Work



Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Computer Organization – Car Hamacher, Zvonks Vranesic, Safea Zaky, Vth Edition, McGraw Hill. 2. Computer	
Recommended Texts	Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI. 3. Structured Computer Organization – Andrew S. Tanenbaum, 4th Edition, PHI/Pearson.	
Websites	https://www.tutorialspoint.com/computer_organization/index.asp	

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

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Programming Fundamentals I		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☒ Practical ☒ Seminar
Module Code	HUC-CS102		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	UGI	Semester of Delivery	
Administering Department	CS	College	HUCCS
Module Leader	Zaid Amjed Al-husseini	e-mail	zaidhusainy@gmail.com
Module Leader's Acad. Title	Assistant . Tecture	Module Leader's Qualification	MSC.
Module Tutor	Zaid Amjed Al-husseini	e-mail	zaidhusainy@gmail.com
Peer Reviewer Name	Non	e-mail	...
Scientific Committee Approval Date	16/9/2025	Version Number	V1

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



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	The following are some key aims and benefits of studying Programming Fundamentals I : 1. Introduction to Programming: Introduce students to the fundamental concepts of programming, including the role of programming languages, the software development process, and basic programming principles. 2. Problem Solving: Teach students how to analyze problems and develop algorithms to solve them. Emphasize problem-solving techniques, algorithm design, and decomposition of complex problems into smaller, manageable parts. 3. Input and Output: Teach students how to interact with the user and handle standard input/output operations, including reading from keyboard and display to screen. 4. Programming Language Basics: Familiarize students with the syntax, semantics, and basic constructs of a programming language, such as variables, data types, control structures (loops, conditionals), and functions. 5. Debugging and Testing: Teach students how to debug and test their programs to identify and fix errors. Explore techniques for error detection, debugging tools, and strategies for writing effective test cases.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The following are some common learning outcomes for an Programming Fundamentals I : 1. Knowledge of Programming Concepts: Demonstrate a solid understanding of fundamental programming concepts, including variables, data types, control structures, and basic algorithms. 2. Problem Solving Skills: Apply problem-solving techniques to analyze and solve programming problems by decomposing them into smaller, manageable parts and designing appropriate algorithms. 3. Proficiency in Programming Language: Develop proficiency in using a specific programming language covered in the course, including understanding the language's syntax, semantics, and basic constructs.



	4. Effective Code Writing: Write clear, well-structured, and readable code that follows coding standards and best practices, including proper indentation, meaningful variable names, and appropriate comments. 5. Debugging and Testing Skills: Use debugging techniques and tools to identify and fix errors in programs. Develop effective test cases and perform testing to ensure program correctness and reliability.
Indicative Contents المحتويات الإرشادية	The indicative contents of an Programming Fundamentals I module have a list of common topics that shown below : 1- Introduction to Programming: Role of programming languages, Software development process, Basic programming principles and concepts. [15 hrs] 2- Problem Solving and Algorithm Design: Problem analysis and requirements specification, Algorithm design techniques (e.g., top-down design, stepwise refinement), Flowcharts and pseudocode. [20 hrs] 3- Input and Output: standard input/output operations, including reading from keyboard and display to screen. [5 hrs] 4- Programming Language Basics: Variables and data types, Operators and expressions, Control structures (loops, conditionals). [30 hrs] 5- Modular Programming: Scope and lifetime of variables. [10 hrs] 6- Debugging and Testing: Common types of programming errors, Debugging techniques and tools. [10 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	To teaching a Programming Fundamentals I module, various strategies can be employed to facilitate effective learning and engagement. Here are some learning and teaching strategies commonly used in Programming Fundamentals I module: 1- Lectures: Delivering lectures to present theoretical concepts, principles, and foundational knowledge of Programming Fundamentals I. Lectures can include visual aids, examples, and demonstrations to enhance understanding. 2- Interactive Discussions: Encourage students to active participate in discussions by asking questions, sharing their thoughts, and engaging in

	peer-to-peer learning. Discussions can focus on challenging concepts, real-world applications, or case studies related to Programming Fundamentals I. 3- Hands-on Lab Sessions: Conduct practical lab sessions where students can gain hands-on experience with Programming Fundamentals I, commands, and programming exercises. These sessions provide an opportunity to reinforce theoretical concepts and develop practical skills. 4- Group Projects: Assign group projects that involve designing, implementing, and evaluating components of a Programming Fundamentals I. Group projects promote teamwork, problem-solving, and practical application of operating system concepts. 5- Online Resources and Tutorials: Provide access to online resources, tutorials, and interactive learning materials related to Programming Fundamentals I. This allows students to explore additional content, reinforce their understanding, and self-assess their progress. 6- Assessments and Feedback: Use a variety of assessment methods such as quizzes, assignments, projects, and exams to evaluate students' understanding of Programming Fundamentals I concepts. Provide timely and constructive feedback to help students improve their knowledge and skills.
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Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	90	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	80	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	170		

Module Evaluation				
تقييم المادة الدراسية				
	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Quizzes	2	10% (10)	5 and 10	LO #1, #3 and #4



Formative assessment	Assignments	2	5% (5)	3 and 12	LO #1, #3 and #4
	Projects / Lab.	2	10% (10)	Continuous	All
	Projects / Pr.	2	10% (10)	7 and 13	All
	Seminar	1	5% (5)	13	All
Summative assessment	Midterm Exam	2hr	10% (10)	9	LO #1, #2 and #3
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Problem solving
Week 2	Algorithms and flow charts
Week 3	Introduction to programming Languages
Week 4	Variables, Constants, keywords, types, operators, expression, assignment
Week 5	Simple I/O Functions
Week 6	Conditional Statements
Week 7	If Statement
Week 8	Nested If
Week 9	Mid Exam
Week 10	Switch Statement
Week 11	Iterative control statements + for Statements
Week 12	While Statement
Week 13	Do while
Week 14	Nested Loops
Week 15	Nested while
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	IDE of Programming Language



Week 2	Examples for Algorithms and flow charts
Week 3	Using the IDE for writing sample of program
Week 4	Programs by using Variables, Constants, keywords, types, operators, expression, assignment
Week 5	Writing codes for 3 Programs Applying Simple I/O Functions
Week 6	Simple Conditional Statements programs
Week 7	Writing codes of If Statement programs
Week 8	Writing codes of Nested If programs
Week 9	Mid Exam
Week 10	Writing codes of Switch Statement programs
Week 11	Writing codes of Iterative control statements + for Statements programs
Week 12	Writing codes of While Statement programs
Week 13	Writing codes of Do while programs
Week 14	Writing codes of Nested Loops programs
Week 15	Writing codes of Nested while programs

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	C++: The Complete Reference, Fourth Edition, Herbert Schildt.	Yes
Recommended Texts	The C++ Programming Language, Third Edition, Bjarne Stroustrup.	Yes
Websites	https://stackoverflow.com/	

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

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



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Human Rights and Democracy		Module Delivery	
Module Type	Support		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	HUC-UOK103			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	UGI	Semester of Delivery		1
Administering Department	CS	College	HUC CS	
Module Leader	Athraa Abdullah Hashi		e-mail	adhraa_abdullah@hilla-unc.edu.iq
Module Leader's Acad. Title	Assist Lecturer		Module Leader's Qualification	M.S.c.
Module Tutor	Athraa Abdullah Hashi		e-mail	adhraa_abdullah@hilla-unc.edu.iq
Peer Reviewer Name	Non		e-mail	...
Scientific Committee Approval Date	16/9/2025		Version Number	V1

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



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	أهداف المادة الدراسية لدراسة مادة حقوق الإنسان والديمقراطية تتعلق بتعريف الطلاب بالمفاهيم الأساسية لحقوق الإنسان والديمقراطية وتعزيز فهمهم لأهمية هذه المفاهيم في المجتمع. وتهدف المادة إلى تنمية التفكير النقدي والقدرة على التحليل والتقييم فيما يتعلق بقضايا حقوق الإنسان والممارسات الديمقراطية. إليك بعض الأهداف الرئيسية للمادة: 1. فهم المفاهيم الأساسية: توفير فهم شامل للمفاهيم الأساسية لحقوق الإنسان والديمقراطية، بما في ذلك القيم والمبادئ التي تقوم عليها. 2. تطوير الوعي القانوني: تعريف الطلاب بالمواثيق والاتفاقيات الدولية والقوانين المحلية المتعلقة بحقوق الإنسان والديمقراطية، وتعزيز الفهم لحقوق الإنسان كحقوق عالمية وشاملة. 3. تحليل القضايا الراهنة: دراسة القضايا الحالية والتحديات التي تواجه حقوق الإنسان والديمقراطية في العالم، مثل التمييز العرقي والديمقراطية وحرية التعبير وحقوق المرأة. 4. تعزيز القدرة على التفكير النقدي: تنمية القدرة على تحليل وتقييم المعلومات والتحليل النقدي للمواقف والحجج المتعلقة بحقوق الإنسان والديمقراطية. 5. تعزيز المشاركة المجتمعية: تشجيع الطلاب على المشاركة في نشاطات المجتمع المتعلقة بحقوق الإنسان والديمقراطية وتعزيز الوعي بأهمية المشاركة المدنية.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	مخرجات التعلم لمادة حقوق الإنسان والديمقراطية تهدف إلى تطوير مجموعة من المهارات والمعرفة لدى الطلاب. إليك بعض مخرجات التعلم الرئيسية التي يمكن أن تتوقعها بعد انتهاء دراسة هذه المادة: 1. المعرفة المفصلة بمفاهيم حقوق الإنسان والديمقراطية: فهم شامل للمفاهيم الأساسية والمبادئ التي تتعلق بحقوق الإنسان والممارسات الديمقراطية على المستوى المحلي والدولي. 2. فهم إطار القوانين والمعاهدات الدولية: المعرفة بالمواثيق والاتفاقيات الدولية المتعلقة بحقوق الإنسان والممارسات الديمقراطية وفهم تأثيرها وتطبيقها على المجتمعات والأفراد. 3. التحليل النقدي للمشاكل والتحديات: القدرة على تحليل القضايا المرتبطة بحقوق الإنسان والديمقراطية وفهم التحديات التي تواجهها المجتمعات المختلفة. 4. المشاركة الفعالة والمسؤولة: القدرة على المشاركة بشكل فعال في نشاطات المجتمع المتعلقة بحقوق الإنسان والديمقراطية، والتأثير على القرارات والتغيير الاجتماعي الإيجابي. 5. التفكير النقدي والتقييم: القدرة على تقييم المواقف والحجج المتعلقة بحقوق الإنسان والديمقراطية وتطبيق التفكير النقدي في تحليل القضايا المعقدة. 6. التعاطف والاحترام للتنوع: تنمية القدرة على فهم واحترام التنوع الثقافي والاجتماعي والديني والجنسي والعرقي وتعزيز التعايش المشترك والتسامح. 7. التواصل الفعال: تنمية المهارات التواصلية والقدرة على التعبير عن الأفكار والمواقف بوضوح.



Indicative Contents المحتويات الإرشادية	Knowing the basics of mathematics, which are necessary for every student, and teaching them to benefit from what they have studied in the service of their country, as well as gaining students the ethics of their scientific specialization.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The lecturer's strategy is to give lectures and conduct short tests with the adoption of giving open assignments and grades as encouragement to students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	30	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	15	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	45		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2hr	30	5 , 10	
	Assignments	2hr	10	every 3 weeks	
	Projects / Pr.				
	Seminar				
Summative assessment	Midterm Exam	2hr	10% (10)	11	
	Final Exam	3hr	50% (50)	17	

Total assessment	100% (100 Marks)		
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Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

	Material Covered
Week 1	نظر وجهة من / (الانسان حقوق مميزات) اسلامية نظر وجهة من / الانسان بحقوق التعريف / الانسان حقوق ماهية (الانسان حقوق مميزات) الغرب
Week 2	الحضارات / الرومانية الحضارة / اليونانية الحضارة / الرافدين وادي حضارة / القديمة الحضارات في الانسان حقوق والهندية الصينية
Week 3	حقوق / المسيحية الديانة في الانسان حقوق / الاسلامية الشريعة في الانسان حقوق / السماوية الشرائع في الانسان حقوق / اليهودية الديانة في الانسان
Week 4	الافكار مستوى على / العالمية والتورات الفكر في الانسان حقوق / والحديثة الوسطى العصور في الانسان حقوق والشرع التورات مستوى على / السياسية والنظريات
Week 5	الثورة د/ الفرنسية الثورة ج/ / الامريكية الثورة ب/ الانكليزية الثورة ا/ والشرع التورات مستوى على الانسان حقوق الروسية
Week 6	الاعتراف المعاصر بحقوق الانسان/ اولا - الاعتراف الدولي بحقوق الانسان/ ثانيا- الاعتراف الاقليمي المعاصر / على الصعيد الاوربي / على الصعيد الامريكي / على الصعيد الافريقي / على الصعيد الاسلامي / على الصعيد العربي/ ثالثا- نشوء المنظمات غير الحكومية ودورها في ميادين حقوق الانسان
Week 7	امتحان نصف الفصل
Week 8	بحقوق الخاصين الدوليين العهدين في- ثانيا / الانسان لحقوق العالمي الاعلان في- اولا / الدولية الشرعة في الانسان حقوق والثقافية والاجتماعية الاقتصادية للحقوق الدولي العهد ب/ والسياسية المدنية للحقوق الدولي العهد ا/ الانسان الاختياري البروتوكول ج/
Week 9	اشكال واجيال حقوق الانسان/ اولا- حقوق الانسان الفردية وحقوق الانسان الجماعية/ ثانيا- اجيال حقوق الانسان/ ا. الجيل الاول -جيل الحقوق المدنية والسياسية/ ب. الجيل الثاني- جيل الحقوق الاقتصادية والاجتماعية والثقافية/ ج. الجيل الثالث- جيل حقوق الانسان الجديدة
Week 10	ماهية الديمقراطية / ا. تعريف الديمقراطية / ب. اشتقاق كلمة الديمقراطية -تطور مفهوم الديمقراطية / ا. المفهوم التقليدي للديمقراطية / ب. المفهوم الحديث للديمقراطية
Week 11	تاريخ الديمقراطية / ا. الديمقراطيات القديمة / ب. تطور الديمقراطية في العصور الوسطى/ ج. الديمقراطيات الحديثة/ د. موجات الديمقراطية في القرن العشرين
Week 12	انواع الحكم الديمقراطي / ا. الديمقراطية المباشرة / ب. الديمقراطية غير المباشرة / ج. الديمقراطية شبه مباشرة / د. الديمقراطية الشعبية/ ه. الديمقراطية الوسيطة / و. الديمقراطية الليبرالية / س. الديمقراطية غير الليبرالية / ح. الديمقراطية الاجتماعية والسياسية
Week 13	اهداف ومبادئ الديمقراطية/ ا. اهداف الديمقراطية / ب. مبادئ الديمقراطية/ ج. مبادئ تحكيم حكم الاكثرية ومفاهيمه/ د. مفهوم التوازن/ ه. مفهوم الشرعية السياسية والثقافة الديمقراطية
Week 14	محاسن ومساوئ الديمقراطية/ ا. محاسن الديمقراطية / ب. مساوئ الديمقراطية الديمقراطية الاسلامية والديمقراطية الحديثة/ اولا- اوجه التوافق بين الديمقراطية الاسلامية والديمقراطية الحديثة / ثانيا - اوجه الاختلاف بين الديمقراطية الاسلامية والديمقراطية الحديثة
Week 15	-الفساد/ اولا -تعريف الفساد/ ثانيا- انواع الفساد العامة / ثالثا- انواع الفساد من حيث الحجم/ رابعا- انواع الفساد من حيث الانتشار/ خامسا- مظاهر الفساد/ سادسا- اسباب الفساد وتأثيره/ سابعا- التحول الاجتماعي والفساد/ ثامنا- محاولة تحجيم الفساد/ تاسعا- الجهات المسؤولة على مكافحة الفساد عالميا
Week 16	التهيئة لامتحان النهائي



Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Calculus. Thomas. book	
Recommended Texts	1- Calculus I .paul Dawkins book 2- All mathematics books are useful for this subject	
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	Digital Logic		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☒ Practical ☒ Seminar
Module Code	HUC-CSIT103		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	UGI	Semester of Delivery	1
Administering Department	CS	College	HUCCS
Module Leader	Dina Ihsan Adnan	e-mail	dina.ehsan@hilla-unc.edu.iq
Module Leader's Acad. Title	Asst. Teacher	Module Leader's Qualification	MSC
Module Tutor	Dina Ihsan Adnan	e-mail	dina.ehsan@hilla-unc.edu.iq
Peer Reviewer Name	Non	e-mail	...
Scientific Committee Approval Date	16/9/2025	Version Number	V1

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



Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	This course aims to give fundamentals of the number systems arithmetic and representation. The course focuses on binary numbers, because the machine language is represented as binary patterns. After understanding the machine signals (zero and one), the course deals with logical gates, Boolean algebra and logical expression, and digital system design.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Logic Gates Learning Objectives Learn that there is a one-to-one relationship between logic gates and Boolean expressions Learn how logic gates are combined to build circuits within processors Learn how logic gates are used to evaluate Boolean expressions to produce a result. Learn how logic gates can be combined to create full systems Learn what full and half adders are.
Indicative Contents المحتويات الإرشادية	Logic gates are based on Boolean algebra [50 hrs]. At any given moment, every terminal is in one of the two binary conditions, false or true. False represents 0, and true represents 1. Depending on the type of logic gate being used and the combination of inputs, the binary output will differ [50 hrs]. Direct contact with students in theoretical or practical sessions for different subjects such as (Standard Forms of Boolean Expressions, Boolean Expressions and Truth Tables, The Karnaugh Map, Karnaugh Map SOP Minimization, Karnaugh Map POS Minimization, Basic Combinational Logic Circuits) [70 hrs].

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	various strategies can be employed to facilitate effective learning and engagement. Here are some learning and teaching strategies commonly used, Lectures: Delivering lectures to present theoretical concepts, principles, and foundational knowledge. Interactive Discussions: Encourage students to actively participate in discussions by asking questions, sharing their thoughts, and engaging in peer-to-peer learning. Discussions can focus on challenging concepts. Hands-on Lab Sessions: Conduct practical lab sessions where students can gain hands-on experience. Assessments and Feedback: Use a variety of assessment methods such as quizzes, assignments, projects, and exams to evaluate students' understanding

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (الساعات الدراسية المنتظمة للطالب أسبوعياً) 	5
Unstructured SWL (h/sem)	95	Unstructured SWL (الساعات الدراسية غير المنتظمة للطالب أسبوعياً)	6

الحمل الدراسي غير المنتظم للطلاب أسبوعيا	الحمل الدراسي غير المنتظم للطلاب خلال الفصل
Total SWL (h/sem)	170
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)	7,12	lec1 to lec 12
	Assignments	1	10% (10)	11	lec 1 to lec 11
	Projects / Lab.	1	10% (10)	14	All
	Projects / Pr.				
	Seminar	1	10% (10)	15	All
Summative assessment	Midterm Exam	2hr	10% (10)	9	
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Number Systems, Binary Numbers, Decimal-to Binary Conversion
Week 2	Binary Arithmetic, Complements of Binary Numbers
Week 3	Signed Numbers, Arithmetic Operations with Signed Numbers
Week 4	Hexadecimal Numbers, Binary Coded Decimal (BCD) 100, Digital Codes
Week 5	Logic Gates
Week 6	Fixed-Function Logic Gates
Week 7	Boolean Operations and Expressions, Laws and Rules of Boolean Algebra



Week 8	Midterm Exam
Week 9	Standard Forms of Boolean Expressions
Week 10	Boolean Expressions and Truth Tables
Week 11	The Karnaugh Map
Week 12	Karnaugh Map SOP Minimization
Week 13	Karnaugh Map POS Minimization
Week 14	Basic Combinational Logic Circuits
Week 15	Implementing Combinational Logic
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Number Systems
Week 2	Logic Gates
Week 3	And , OR gates
Week 4	Arithmetic operation gate
Week 5	Addition, subtraction operations
Week 6	multiplication and division process
Week 7	XOR, XNOR gates
Week 8	Design for logic circuits
Week 9	convert from logic circuits to truth table
Week 10	Timing diagram
Week 11	The Karnaugh Map
Week 12	Karnaugh Map SOP Minimization
Week 13	Karnaugh Map POS Minimization
Week 14	Basic Combinational Logic Circuits



Week 15	Implementing Combinational Logic
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Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Thomas L. Floyd, "Digital Fundamentals"	
Recommended Texts	Digital Fundamentals 11 th Edition, 2015	
Websites	http://www.sasurieengg.com/e-course-material/I-year-E-course-material-II-sem/7.CS6201%20-DPSD.pdf https://www.scribd.com/doc/219587519/Digital-Principles-and-System-Design https://www.vidyarthiplus.com/vp/thread-17782.html#WFrbFN96po	

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	Arabic Language		Module Delivery	
Module Type	Support		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	HUC-UOK101			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	UGI	Semester of Delivery		1
Administering Department	CS	College	HUCCS	
Module Leader	Ayad Hamza Shaheed		e-mail	gan162gna@gmail.com
Module Leader's Acad. Title	Assist Lecturer		Module Leader's Qualification	Ph.D.
Module Tutor	Ayad Hamza Shaheed		e-mail	gan162gna@gmail.com
Peer Reviewer Name	Non		e-mail	...
Scientific Committee Approval Date	16/9/2025		Version Number	V1

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



Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	أهداف المادة الدراسية لدراسة مادة اللغة العربية تتعلق بتعريف الطلاب بأهم القواعد الأساسية للإملاء الصحيح وتجنب الوقوع في الخطأ في التعبير والتمكن منه بصورة تتناسب مع المستوى الثقافي للطلاب، إليك بعض الأهداف الرئيسية للمادة: 1. فهم القواعد الأساسية لعلم الإملاء التي يحتاجها الطالب في دراسته وعمله مستقبلاً. 2. التمكن من تطبيق هذه القواعد بسهولة ويسر دون الحاجة إلى حفظها عن ظهر قلب. 3. يميز الطالب الأخطاء الإملائية واللغوية البسيطة لتجنب الوقوع فيها. 4. القدرة على التعبير بشكل سليم دون الحاجة للاستعانة بغيره. 5. يعرف الطالب أهمية اللغة العربية في حياته والعمل زيادة ذخيره اللغوية وتشخيص أهم الأخطاء والصعوبات التي يعاني منها ومعالجتها.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	مخرجات التعلم لمادة اللغة العربية تهدف إلى تطوير مجموعة من المهارات والمعرفة لدى الطلاب. ادناه بعض مخرجات التعلم الرئيسية بعد انتهاء دراسة هذه المادة: 1. شرح القواعد الأساسية للكتابة في مادة اللغة العربية. 2. تطبيق المعارف اللغوية بمهارة ويسر. 3. تحليل التراكيب اللغوية والنصوص البسيطة التي يستعملها في حياته اليومية. 4. إظهار الثقة بالنفس والقدرة على التعبير بسهولة. 5. معالجة الأخطاء البسيطة لديه.
Indicative Contents المحتويات الإرشادية	1- نشر اللغة العربية بين أفراد المجتمع عموماً لفتح آفاق جديدة لتطوير المهارات اللغوية ودعمها. 2- التحديات المختلفة التي تواجه المجتمع على صعيد التربية والتعليم ولا سيما في مجال تدريس اللغة العربية، ومحاولة التوصل إلى حلول ناجعة ومفيدة لتعزيز القدرات اللغوية. 3- الاستفادة من وسائل الاتصال الحديثة كالإنترنت وغيرها في عملية التعلم.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	يمكن استخدام العديد من الاستراتيجيات البسيطة التي تسهم في تطوير علمية التعلم بشكل فعال وتجعلها ممتعة ومفيدة ومنها: 1- استراتيجية الرؤوس المرقمة. 2- استراتيجية أعواد المثلجات. 3- استراتيجية فكر نلوج شارك. 4- استراتيجية المكعبات. 5- استراتيجية صحح الخطأ. 6- استراتيجية الكرسي الساخن.

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	30	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	47 + 3 Final Exam = 50		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	4 marks	5,7,9	2,3,4
	Assignments	2	4 marks	3,5	2,3
	Onsite Assignments	10	1 marks	all	all
	Reports	1	10 marks	6,7,8,9,10	all
Summative assessment	Midterm Exam	2hr	10% (10)	9	
	Final Exam	3hr	50% (50)	17	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	مقدمة تعريفية بعلم الإملاء وواضعه ونشأته وتطوره
Week 2	الهمزة الأولية
Week 3	الهمزة المتوسطة 1
Week 4	الهمزة المتوسطة 2
Week 5	الهمزة المنطرفة



Week 6	الهمزة المتطرفة وتنوين الفتح
Week 7	التاء المربوطة والتاء المبسوطة
Week 8	الضاد والظاء
Week 9	امتحان نصف الفصل
Week 10	الألف المقصورة
Week 11	حروف الزيادة والنقصان
Week 12	العدد والمعدود 1
Week 13	العدد والمعدود 2
Week 14	العدد والمعدود 3
Week 15	الشدة والمدة
Week 16	التهيئة لامتحان النهائي

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	الإملاء الفريد، نعوم جرجيس زراير ، مكتبة اللغة العربية ، بغداد- العراق، ط6، 2017م. الإملاء الواضح، عبد المجيد النعيمي، مكتبة دار المتنبي، بغداد- العراق، ط3، 1967م.	
Recommended Texts		
Websites	مكتبة لسان العرب الإلكترونية شبكة الألوكة موقع فصيح مكتبة نرجس الإلكترونية المكتبة الوقفية الإلكترونية مكتبة نور الإلكترونية	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group	A - Excellent	امتياز	90 - 100	Outstanding Performance



(50 - 100)	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	Programming Fundamentals II		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☒ Practical ☒ Seminar	
Module Code	HUC-CS104			
ECTS Credits	7			
SWL (hr/sem)	175			
Module Level	UGI	Semester of Delivery		2
Administering Department	CS	College	College of Science	
Module Leader	Ayat Nadhum Kadhum		e-mail	ayat.nad hum @ hilla-unc.ed u.iq
Module Leader's Acad. Title	Assistant Prof.		Module Leader's Qualification	Ph.D.
Module Tutor	Ayat Nadhum Kadhum		e-mail	ayat.nad hum @ hilla-unc.ed u.iq
Peer Reviewer Name	Non		e-mail	...
Scientific Committee Approval Date	16/09/2025		Version Number	V1



Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CS102	Semester	1
Co-requisites module	Non	Semester	...

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية 	The following are some key aims and benefits of studying Programming Fundamentals II: 1. Problem Solving: Teach students how to analyze problems and develop algorithms to solve them. Emphasize problem-solving techniques, algorithm design, and decomposition of complex problems into smaller, manageable parts. 2. Debugging and Testing: Teach students how to debug and test their programs to identify and fix errors. Explore techniques for error detection, debugging tools, and strategies for writing effective test cases. 3. Data Structures: Introduce students to fundamental data structures such as arrays, stacks, queues, structures. Explore their properties, implementation, and usage in solving programming problems. 4. Modular Programming: Introduce the concept of modular programming, including the use of functions, parameter passing, and code reuse. Emphasize the importance of modular design and writing reusable and maintainable code. 5. Programming Best Practices: Introduce students to programming best practices and coding standards, including code documentation, naming conventions, code formatting, and code optimization techniques. 6. Files Input and Output: Teach students how to interact with the user and handle input/output operations, including reading from and writing to files, standard input/output, and error handling. 7. Introduction to Object-Oriented Programming (OOP): Introduce the principles and concepts of OOP, including classes.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The following are some common learning outcomes for an Programming Fundamentals II : 1. Effective Code Writing: Write clear, well-structured, and readable code that follows coding standards and best practices, including proper indentation, meaningful variable names, and appropriate comments. 2. Use of Data Structures: Apply appropriate data structures, such as arrays, linked lists, stacks, and queues, to store and manipulate data effectively in programming problems. 3. Modular Design and Reusability: Design and implement modular programs by breaking them into reusable functions or methods, facilitating code

	reuse, improving maintainability, and promoting good software engineering practices. 4. Debugging and Testing Skills: Use debugging techniques and tools to identify and fix errors in programs. Develop effective test cases and perform testing to ensure program correctness and reliability. 5. Understanding of Object-Oriented Programming (OOP) Concepts.
Indicative Contents المحتويات الإرشادية	The indicative contents of an Programming Fundamentals II module have a list of common topics that shown below : 1- Modular Programming: [25 hrs] Functions and procedures, Scope and lifetime of variables, Parameter passing mechanisms. 2- Data Structures: [25 hrs] Arrays, Strings and lists, Structures, Stacks and queues. 3- Input and Output: [15 hrs] Standard input/output, Reading from and writing to files, Error handling and exception handling. 4- Debugging and Testing: Common types of programming errors, Debugging techniques and tools. [20 hrs] 5- Object-Oriented Programming (OOP) Concepts: Classes and objects. [5 hrs]

 Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	To teaching an Programming Fundamentals II module, various strategies can be employed to facilitate effective learning and engagement. Here are some learning and teaching strategies commonly used in Programming Fundamentals II module: 1- Lectures: Delivering lectures to present theoretical concepts, principles, and foundational knowledge of Programming Fundamentals II. Lectures can include visual aids, examples, and demonstrations to enhance understanding. 2- Interactive Discussions: Encourage students to actively participate in discussions by asking questions, sharing their thoughts, and engaging in peer-to-peer learning. Discussions can focus on challenging concepts, real-world applications, or case studies related to Programming Fundamentals II.

	3- Hands-on Lab Sessions: Conduct practical lab sessions where students can gain hands-on experience with Programming Fundamentals II, commands, and programming exercises. These sessions provide an opportunity to reinforce theoretical concepts and develop practical skills. 4- Group Projects: Assign group projects that involve designing, implementing, and evaluating components of an Programming Fundamentals II. Group projects promote teamwork, problem-solving, and practical application of operating system concepts. 5- Online Resources and Tutorials: Provide access to online resources, tutorials, and interactive learning materials related to Programming Fundamentals II. This allows students to explore additional content, reinforce their understanding, and self-assess their progress. 6- Assessments and Feedback: Use a variety of assessment methods such as quizzes, assignments, projects, and exams to evaluate students' understanding of Programming Fundamentals II concepts. Provide timely and constructive feedback to help students improve their knowledge and skills.
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Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	90	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	80	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	170		



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, #3 and #4 , #5
	Assignments	2	5% (5)	3 and 12	LO #1, #3 and #4
	Projects / Lab.	2	10% (10)	Continuous	All
	Projects / Pr.	2	10% (10)	7 and 13	All
	Seminar	1	5% (5)	13	All
Midterm Exam		2hr	10% (10)	9	LO #1, #2 and #3

Summative assessment	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Functions
Week 2	Function Types
Week 3	The concept of Recursion
Week 4	Array
Week 5	1D array
Week 6	2D array (Matrix)
Week 7	Array of Characters (Strings)
Week 8	String Processing
Week 9	Midterm Exam
Week 10	Arrays and functions
Week 11	Structures
Week 12	Array of structures and Nested Structures
Week 13	Stack and Queue
Week 14	Pointers
Week 15	Files
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Writing Codes using Functions
Week 2	Writing Codes using Function Types
Week 3	Writing Codes using The concept of Recursion

Week 4	Writing Codes using Arrays
Week 5	Writing Codes using 1D arrays
Week 6	Writing Codes using 2D array (Matrix)s
Week 7	Writing Codes using Array of Characters (Strings)
Week 8	Writing Codes using String Processing
Week 9	Midterm Exam
Week 10	Writing Codes using Arrays and functions
Week 11	Writing Codes using Structures
Week 12	Writing Codes using Array of structures and Nested Structures
Week 13	Writing Codes using Stack and Queue
Week 14	Pointers
Week 15	Files

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	C++: The Complete Reference, Fourth Edition, Herbert Schildt.	Yes
Recommended Texts	The C++ Programming Language , Third Edition , Bjarne Stroustrup.	Yes
Websites	https://stackoverflow.com/	

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

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



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Discrete Structure		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☒ Practical ☒ Seminar	
Module Code	HUC-CSIT104			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	UGI	Semester of Delivery		2
Administering Department	CS	College	HUCCS	
Module Leader	Sami Kadhim Al-thabhwai		e-mail	sami_kadhim@hilla-unc.edu.iq
Module Leader's Acad. Title	Assist Professor		Module Leader's Qualification	MS.c
Module Tutor	Sami Kadhim Al-thabhwai		e-mail	sami_kadhim@hilla-unc.edu.iq
Peer Reviewer Name	Non		e-mail	...
Scientific Committee Approval Date	16/09/2025		Version Number	V1
				
Relation with other Modules				
العلاقة مع المواد الدراسية الأخرى				
Prerequisite module	Non		Semester	...
Co-requisites module	Non		Semester	...

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	give the students the general idea for the important subject that is related with the computer science to enable them to understand the other subject
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	give the main principle of set theory and graph theory so as mathematical logic and number theory which help the student in the other stages
Indicative Contents المحتويات الإرشادية	Mathematical Logic, Propositional Logic, Predicate Logic [10 hour] Sets, Set properties, operations of sets [5 hour] Relations and their types, Composite of relations, Equivalent relations [15 hour] Functions, Properties of functions, Recursive functions [10 hour] mathematical induction [5 hour] Basic counting, Sum principles, Product principles [10 hour] Graph theory, Graph types and its applications, Degree points of graphs [20 hour] Trees and its details [15 hour] Number theory, divisibility, greatest common divisor, prime numbers [20 hour] vector and matrices [15 hour] Transpose, determinant and square matrices [10 hour] inverse of matrices [5 hour] polish notation [5 hour]



Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Throughout the module, it is important to employ effective learning and teaching strategies to ensure students grasp the concepts and develop the necessary skills. The main strategy that will be adopted in delivering this module: 1. Giving lectures.

	2. Practical Exercises: Provide students with opportunities to practice their skills through practical exercises as a basic concept implementation 3. Conducting theoretical exams. 4. Request a report from students to teach them how to do research on a specific topic. 5. Request some small projects from student groups of real-world examples and case studies to demonstrate the relevance and impact of discrete structure	
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Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	30	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	115	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	8
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	145		

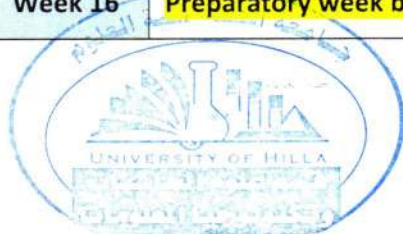


Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10%(10)	4 and 8	1 to 3 and 5 to 7
	Assignments	2	10%(10)	12	1 to 11
	Projects / Pr.	1	10%(10)	11	all
	Seminar	1	10%(10)	15	11 to 14
Summative assessment	Midterm Exam	2hr	10% (10)	10	1 to 9
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Mathematical Logic, Propositional Logic, Predicate Logic
Week 2	Sets, Set properties, operations of sets
Week 3	Relations and their types, Composite of relations, Equivalent relations
Week 4	Functions, Properties of functions, Recursive functions
Week 5	mathematical induction
Week 6	Basic counting, Sum principles, Product principles
Week 7	Graph theory, Graph types and its applications, Degree points of graphs
Week 8	Trees and its details
Week 9	Number theory, divisibility, greatest common divisor, prime numbers
Week 10	Exam
Week 11	vector and matrices
Week 12	Transpose ,determinant and square matrices
Week 13	inverse of matrices
Week 14	polish notation
Week 15	seminar discussion
Week 16	Preparatory week before the final Exam



Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1-Dr Jassim toama sarsoh , "Discrete structure", 1992. 2- Discrete mathematics, Seymour Lipschutz, Marc Lipson 2007.	yes
Recommended Texts	1-Discrete Mathematical Structures With Applications To Computer Science By Trem Blay Manohar. 2-Introduction To Discrete Structures By perpetrate And Yeh ,1973 3-Discrete Mathematics by Seymour Lipschutz and Marc Lipson ,2007	yes

Websites	google scholar	

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	Calculus II		Module Delivery
Module Type	Basic		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	HUC-CSIT102		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGI	Semester of Delivery	2
Administering Department	CS	College	HUCCS
Module Leader	Sami Kadhim Al-thabhwai		e-mail: sami_kadhim@hilla-unc.edu.iq
Module Leader's Acad. Title	Assist Professor		Module Leader's Qualification: MS.c
Module Tutor	Sami Kadhim Al-thabhwai		e-mail: sami_kadhim@hilla-unc.edu.iq
Peer Reviewer Name	Non		e-mail: ...
Scientific Committee Approval Date	16/09/2025		Version Number: V1



Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CSIT101	Semester	1
Co-requisites module	Non	Semester	...

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	The course aims to study the various types of mathematical functions and how to calculate their derivatives through many different methods of derivation, such as the usual and implicit derivation, as well as the study of the integrals of these functions and the different methods of calculating the integration of functions, whether by the usual or approximate methods.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A- Cognitive goals A1- Knowing the transcendental functions, which differ from the usual mathematical functions. A 2- Knowing its characteristics and drawings A3- Know how to find the derivative of each function A4- Knowledge of calculating integrals in different ways B - The soft skills objectives of the course. B1 - Students' knowledge of different types of mathematical functions. B2 - How to find derivatives and integrals for different functions
Indicative Contents المحتويات الإرشادية	Knowing the basics of mathematics, which are necessary for every student, and teaching them to benefit from what they have studied in the service of their country, as well as gaining students the ethics of their scientific specialization. ● Part1: Derivation of functions (30 hrs) ● Part2: Implicit derivation (30 hrs) ● Part3: Integration of functions of all kinds (30 hrs) ● Part4: Fundamental theorem of calculus (30 hrs)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The lecturer's strategy is to give lectures and conduct short tests with the adoption of giving open assignments and grades as encouragement to students.
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Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	45	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	120		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2hr	30	5 , 10	
	Assignments	2hr	10	every 3 weeks	
	Projects / Pr.				
	Seminar				
Summative assessment	Midterm Exam	2hr	10% (10)	12	
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Derivation of functions
Week 2	Calculate the slope of the derivative

Week 3	Derivation of functions by to the definition of derivation and by derivation laws
Week 4	Implicit derivation
Week 5	Derivation into ranks higher than one
Week 6	First exam
Week 7	Derivation by to the chain rule , Derivation of trigonometric functions and their inverses
Week 8	Derivation of exponential and logarithmic functions
Week 9	L'Hopital base
Week 10	Integration of functions of all kinds
Week 11	definite integral
Week 12	Second exam
Week 13	indefinite integral , theorem of calculus
Week 14	integration methods
Week 15	Approximate methods for calculating integration
Week 16	

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1- Calculus. Thomas. book 2- Derivatives and integration. book	
Recommended Texts	1- Calculus I .paul Dawkins book 2- All mathematics books are useful for this subject	
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	English Language I		Module Delivery	
Module Type	Support		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	HUC-UOK102			
ECTS Credits	3			
SWL (hr/sem)	75			
Module Level	UGI	Semester of Delivery		2
Administering Department	CS	College	HUC	
Module Leader	Ammar Hassan Obayes		e-mail	ammar_hassan@hilla-unc. edu. iq
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	Master of Arts
Module Tutor	Ammar Hassan Obayes		e-mail	ammar_hassan@hilla-unc. edu. iq
Peer Reviewer Name	Non		e-mail	...
Scientific Committee Approval Date	16/09/2025		Version Number	V1



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

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

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Providing students with written expression skills so that they can write simple compositions while linking sentences correctly.
Indicative Contents المحتويات الإرشادية	Developing students' ability to understand what they read in English. Part 1: Question Words: their meanings and uses (30 hrs) Part2: Adverbs of frequency (40 hrs)

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

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

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

Total assessment	100% (100 Marks)		
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Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Question Words: their meanings and uses
Week 2	Making Wh-questions
Week 3	Doing exercises on Wh-questions
Week 4	Present continuous: form and uses
Week 5	Present simple: form and uses
Week 6	Mid-term Exam
Week 7	Adverbs of frequency
Week 8	Comparison between the uses of Present continuous and Present simple
Week 9	Doing exercises on the Present continuous and Present simple
Week 10	Past simple: form and uses
Week 11	Past continuous: form and uses
Week 12	Comparison between the uses of past continuous and past simple
Week 13	Doing exercises on the past continuous and past simple
Week 14	The use of in, on, at in time expressions
Week 15	Seminar Discussion
Week 16	Preparatory week before the final Exam

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

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	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	Professional Ethics		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☒ Seminar
Module Code	HUC-CS102		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGI	Semester of Delivery	2
Administering Department	CS	College	HUCCS
Module Leader	Ali Faris Razzaq		e-mail ali.faris@hilla-unc.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MS.c
Module Tutor	Ali Faris Razzaq		e-mail ali.faris@hilla-unc.edu.iq
Peer Reviewer Name	Non	e-mail	...
Scientific Committee Approval Date	16/09/2025	Version Number	V1



Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CS101	Semester	1
Co-requisites module	Non	Semester	...

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Define professional ethics and their importance. 2. Identify the core principles of professional ethics. 3. Understand the application of professional ethics in different professions. 4. Analyze ethical dilemmas and make ethical decisions. 5. Develop strategies for maintaining ethical conduct throughout your career.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	At the end of the course the student would: 1. Ability to define key terms related to professional ethics, such as: Ethics Morality 2. Ability to distinguish between personal, professional, and ethical values. 3. Ability to Explain the importance of professional ethics in different fields. 4. Ability to Describe the historical development of professional ethics.
 Indicative Contents المحتويات الإرشادية	Part I: Introduction to Professional Ethics: (25 hrs.) ● Definition and importance of professional ethics in various fields. ● Core principles of professional ethics (e.g., honesty, integrity, accountability, fairness, respect). ● Distinguishing personal, professional, and ethical values. Part II: Ethical Frameworks and Decision-Making: 25 ● Introduction to different ethical frameworks and decision-making models (e.g., utilitarian, deontological, virtue ethics). ● Applying frameworks to analyze ethical dilemmas and conflicts of interest in professional settings. ● Evaluating consequences and considering various stakeholders in ethical decision-making. ● Justifying ethical choices and developing sound reasoning skills. part III: Specific Ethical Issues in the Field: (25 hrs.) ● For general module ● For computer science specific module ○ Privacy and data protection ○ Algorithmic bias and fairness ○ Artificial intelligence and emerging technologies ○ Cyber security and digital ethics

part III: Professional Responsibilities and Development: (25hrs.)

- Understanding professional codes of ethics relevant to the specific field.
- Strategies for maintaining ethical conduct throughout your career.
- Recognizing personal biases and their potential influence on ethical judgment.
- Importance of lifelong learning and staying updated on evolving ethical issues.
- Identifying resources and support systems available for addressing ethical concerns in the workplace.
- Strategies for reporting and addressing unethical behavior within your profession.

Part IV: Case Studies and Discussion: (25)

- Engaging with real-world case studies to apply ethical frameworks and analyze complex scenarios.
- Participating in discussions to foster critical thinking, diverse perspectives, and ethical reasoning skills.



Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Throughout the module, it is important to employ effective learning and teaching strategies to ensure students grasp the concepts and develop the necessary skills. The main strategy that will be adopted in delivering this module:

Giving lectures.

Conducting theoretical exams.

Request a report from students to teach them how to do research on a specific topic.

Request some small projects from student groups of real-world examples and case studies to demonstrate the relevance

Strategies

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem)	60	Structured SWL (h/w)	4
الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	85	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعياً	60
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	145		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	20% (20)	3 and 9	CL: 2,3 and 8,9
	H.W	4	8% (8)	5 and 12	CL: 5 and 11
	H.W at home	2	4%(4)	2 and 7	CL:2,3,4,5,6,7
	Report	1	5% (5)	5 and 9	CL: 4,5 and 12, 13
	H.W in college	1	3%(3)	8	CL:3,4,5,6,7
Summative assessment	Midterm Exam	2hr	10% (10)	6	CL: 1 – 5
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		



Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Professional Ethics
Week 2	Ethical Frameworks and Decision-Making
Week 3	Specific Ethical Issues in General Field
Week 4	Specific Ethical Issues in Computer Science Field
Week 5	Exam1
Week 6	Professional Responsibilities and Development
Week 7	Case Studies and Discussion
Week 8	Social Responsibility
Week 9	Social responsibility factors
Week 10	Exam2
Week 11	Computer crimes and their most important types
Week 12	The basic foundations of professional ethics

Week 13	Social and ethical responsibility in administrative functions
Week 14	Exam3
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Koehn, D. (2006). The ground of professional ethics. Routledge.	
Recommended Texts	Tucker, A. B. (Ed.). (2004). Computer science handbook. CRC press.	
Websites	https://www3.cs.stonybrook.edu/~mueller/teaching/cse302	

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 II		Module Delivery
Module Type	Support		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	HUC-UOK202		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGII	Semester of Delivery	
Administering Department	CS	College	HUC
Module Leader	Ammar Hassan Obayes	e-mail	ammar_hassan@hilla-unc.edu. iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Master of Arts
Module Tutor	Ammar Hassan Obayes	e-mail	ammar_hassan@hilla-unc.edu. iq
Peer Reviewer Name	Non	e-mail	...
Scientific Committee Approval Date	16/09/2025	Version Number	V1



Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	UOK102	Semester	2
Co-requisites module	Non	Semester	...

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

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

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

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



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

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



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

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	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	Data Base		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☒ Seminar
Module Code	HUC-CS202		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGII	Semester of Delivery	3
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Hadeel Talib mangi	e-mail	hadeel_talib@hilla-unc.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MS.C
Module Tutor	Hadeel Talib mangi	e-mail	hadeel_talib@hilla-unc.edu.iq
Peer Reviewer Name	Non	e-mail	...
Scientific Committee Approval Date	16/09/2025	Version Number	V1

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Non	Semester	...
Co-requisites module	Non	Semester	...

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1- Understanding the principles and methods of designing databases, as well as to learn about the various types of databases. 2- Exploring the reasons behind the emergence of databases, the functions of database management systems, and the various architectural frameworks used to build database systems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية 	1. Introduction to the principles and basics of databases, their systems, and types. 2. Application of database concepts. 3. Understanding the importance of database systems. 4. Distinguishing between traditional file systems and database systems. 5. Differentiating between database systems and relational database systems. 6. Ability to describe database systems. 7. Capability to deliver lectures on database systems. 8. Proficiency in designing a database system. 9. Aptitude to learn and train on various traditional and relational database systems. 10. Skill to manage dialogues and discussions related to database systems.
Indicative Contents المحتويات الإرشادية	<u>Part A: Introduction to databases</u>

	-Characteristics of the Database Approach and Database Administrator and End users. [10 hrs] -Basics of MySQL. MySQL Syntax. MySQL Create DB, Create table, SQL dropStatements to manipulate data [10 hrs] <u>Part B: Database System Concepts and Architecture</u> -Data Models, Schemas, and Instances [10 hrs] -Categories of Data Models and Schemas, Instances, and Database State [15 hrs] -Three-Schema Architecture and Data Independence [15 hrs] -Database Languages and Interfaces DBMS Interfaces [10 hrs] -Database purpose. Database Management Systems (DBMS). DBMS architecture. Data independence. [15 hrs] -Database System Utilities and Centralized and Client/Server Architectures for DBMSs [15 hrs] <u>Part C: The Relational Data Model, Relational Database Constraints and Relational algebra and relational calculus</u> -Relational Model Concepts and Domains, Attributes, Tuples, and Relations [10 hrs] - Relational Algebra and Relational Operations [10 hrs].
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Using technology when giving lectures. 2. Provide the students with all the tools that will help them to carry out practical exercises within laboratories for databases 3. Provide the student with key vocabulary and help with database systems. 4. Asking the student to present a group seminar and design database systems. 5. Homework, Quizzes, Monthly theoretical and practical exams

	and Final exam. 6. Ask the student for scientific reports and group project 7. Asking the student and urging him to participate in scientific discussions. 8. Enhancing the student's self-confidence by praising him in front of his colleagues
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Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	60	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	120		



Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5%(5)	4 and 10	
	Assignments	1	5%(5)	7	
	Projects / Lab.	1	15%(15)	continues	
	Projects / Pr.	2	5% (5)	6 and 15	
	Seminar	1	5%(5)	13	
Summative assessment	Midterm Exam	2hr	20% (15)	8	
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered

Week 1	Introduction to database
Week 2	Characteristics of the Database Approach
Week 3	Database System Concepts and Architecture
Week 4	Schema Architecture of database
Week 5	Centralized and Client/Server Architectures for DBMSs
Week 6	Introduction to Relational algebra and relational calculus
Week 7	Relational Operations
Week 8	Midterm Exam
Week 9	Mapping of Binary Relation Types
Week 10	Universal Tables and Functional Dependencies
Week 11	Database Normalization
Week 12	Types of Normalisation
Week 13	Database Security
Week 14	Mapping of Binary Relation Types
Week 15	Final Project Seminar
Week 16	Preparatory week before the final Exam



Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Material Covered

Week 1	Introduction to XAMPP software
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Week 2	Fundamental Operations
Week 3	MySql Insert INTO syntax, WHERE clause , Update , and Order by syntax
Week 4	Import database, Select..where syntax, and Alter...Add syntax
Week 5	The MySQL AND, OR and NOT Operators, LIMIT Syntax, LIKE and calculus operations (MAX,MIN,AVE, AND SUM)
Week 6	The IS NOT NULL Operator, IN AND BETWEEN SYNTAX
Week 7	Midterm Exam
Week 8	MySQL Aliases, Group by and Having clause
Week 9	Foreign Key, and MySQL INNER JOIN Keyword
Week 10	MySQL LEFT and RIGHT JOIN Keyword
Week 11	Join Three Tables, and Self Join, , and The MySQL CASE Statement
Week 12	The MySQL ANY and ALL Operators
Week 13	MySQL NULL and IFNULL Functions, MySql Unique constraint
Week 14	Applying all joins on three tables
Week 15	Project Discussion



Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Elmasri, R., & Navathe, S. (2011). Fundamentals of database systems sixth edition pearson	

	education. Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.	
Recommended Texts	Powell, G. (2006). <i>Beginning database design</i> . John Wiley & Sons.	
Recommended Interactive Websites	SQLCourse: Beginner & Advanced Interactive SQL Tutorials http://www.db-book.com https://www.w3schools.com/MySQL/default.asp	

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	Data Structure		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☒ Seminar
Module Code	HUC-CS201		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGII	Semester of Delivery	3
Administering Department	CS	College	HUCCS
Module Leader	Dina Ihsan Adnan	e-mail	dina.ehsan@hilla-unc.edu.iq
Module Leader's Acad. Title	Asst. Teacher	Module Leader's Qualification	M.S.c.
Module Tutor	Dina Ihsan Adnan	e-mail	dina.ehsan@hilla-unc.edu.iq
Peer Reviewer Name	Non	e-mail	...
Scientific Committee Approval Date	15 /6/ 2023	Version Number	V1

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	HUC- CSIT104	Semester	2
Co-requisites module	Non	Semester	...



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Understand the general principle of data structures and their usefulness 2. Knowing the types of data structures and the main principle of each structure 3. Knowledge of applications related to the subject and other fields of knowledge
Module Learning Outcomes مخرجات التعلم للمادة الدراسية 	1. Understanding Fundamental Data Structures: The course aims to provide students with a solid understanding of fundamental data structures such as arrays, linked lists, stacks, queues, trees, graphs, and hash tables. Students learn about the characteristics, operations, and implementation details of these data structures. 2. Implementing Data Structures: The course focuses on teaching students how to implement various data structures in a programming language of their choice. This hands-on experience helps students gain practical skills in implementing and manipulating data structures efficiently. 3. Problem Solving: Data Structures course typically includes problem-solving exercises and assignments. Students are presented with real-world problems and learn how to model them using appropriate data structures. They develop problem-solving skills by designing algorithms and implementing solutions using the learned data structures. 4. Memory Management: Understanding data structures also involves understanding how memory is managed in a program. Students learn about concepts such as dynamic memory allocation, pointers, memory leaks, and memory optimization techniques to ensure efficient use of memory in data structures. 5. Algorithmic Thinking and Efficiency: The course cultivates algorithmic thinking skills in students. They learn how to break down complex problems into smaller, solvable tasks and design efficient algorithms using appropriate data structures.

	Emphasis is placed on optimizing algorithms for time and space efficiency.
Indicative Contents المحتويات الإرشادية 	In Data Structures, there are several key components that should be considered. While the specific contents may vary depending on the nature of the structure and the context in which it is being used, the basic contents in Data Structures are: <u>Part A – Data structures principles</u> 1. Introduction to Data Structures: Overview of data structures, their importance, and their role in problem-solving. Introduction to the basic terminology and concepts related to data structures (collections) [10 hrs] 2. Arrays: Study of arrays as a fundamental data structure. Understanding the concept of indexing, accessing, and manipulating array elements. Exploring multidimensional arrays and their applications. [15 hrs] <u>Part B – Linear Structures</u> 1. Stacks: Understanding the stack data structure and its LIFO (Last-In-First-Out) behavior. Implementing stack operations, such as push, pop, and peek. Applications of stacks, such as expression evaluation, function call management, and backtracking . [15 hrs] 2. Queues: Introduction to queues and their FIFO (First-In-First-Out) behavior. Implementing queue operations, such as enqueue and dequeue. Exploring different types of queues, including circular queues and priority queues. Applications of queues in real-world scenarios [15 hrs] <u>Part C – Nonlinear Structures</u> 1. Linked Lists: Introduction to linked lists as a dynamic data structure. Understanding the different types of linked lists, such as singly linked lists, doubly linked lists, and circular linked lists. Operations on linked lists, including insertion, deletion, traversal, and searching. [15 hrs] 2. Trees: Study of tree structures, including binary trees, binary search trees, AVL trees, and B-trees. Understanding tree

	traversal algorithms (pre-order, in-order, post-order) and operations such as insertion, deletion, and searching in trees. Applications of trees, such as hierarchical data representation and sorting [15 hrs] 3. searching algorithms (e.g., binary search) [15 hrs] 4. graph algorithms (e.g., breadth-first search, depth-first search) [15 hrs] 5. Hash Tables: Understanding the concept of hashing and hash functions. Exploring hash table data structure and collision resolution techniques (chaining, open addressing). Implementing hash table operations, such as insertion, deletion, and searching. Applications of hash tables, such as dictionary implementations and efficient lookup. [15 hrs] 6. Recursion: Understanding the concept of recursion and its applications in data structures and algorithms. [15 hrs]
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم



Strategies

Throughout the module, it is important to employ effective learning and teaching strategies to ensure students grasp the concepts and develop the necessary skills. The main strategy that will be adopted in delivering this module:

Giving lectures.

Practical Exercises within the laboratories: Provide students with opportunities to practice their skills through practical exercises.

Conducting theoretical exams.

Request a report from students to teach them how to do research on a specific topic.

Request some small projects from student groups of real-world examples and case studies to demonstrate the relevance and impact of different Data structures

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem)	60	Structured SWL (h/w)	4
الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem)	85	Unstructured SWL (h/w)	6
الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem)	145		
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	
	Assignments	2	5% (5)	2 and 12	
	Projects / Lab.	1	10% (10)	Continuous	
	Projects / Pr.	2	10% (10)	6 and 15	
	Seminar	1	5% (5)	14	
Summative assessment	Midterm Exam	2hr	10% (10)	8	
	Final Exam	3hr	50% (50)	17	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Data structures
Week 2	Arrays, structures, pointers, memory allocation
Week 3	Stack and their basic operations.
Week 4	Queue and their basic operations.
Week 5	Recursion
Week 6	Single linked list
Week 7	double linked list
Week 8	circular linked list



Week 9	Midterm Exam
Week 10	Trees, binary search trees and basic operations
Week 11	Graphs and basic algorithms on graphs: depth first and breadth first search
Week 12	Sorting Algorithms
Week 13	Searching Algorithms
Week 14	Dijkstra's algorithm. Priority queues
Week 15	Seminar Discussion
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Programming fundamentals overview
Week 2	Lab 2: Arrays, structures, pointers, memory allocation
Week 3	Lab 3: Stack and their basic operations.
Week 4	Lab 4: Queue and their basic operations.
Week 5	Lab 5: Recursion
Week 6	Lab 6: Single linked list
Week 7	Lab 7: double linked list
Week 8	midterm exam
Week 9	Lab 9: circular linked list
Week 10	Lab 10: Trees, binary search trees and basic operations
Week 11	Lab 12: Graphs and basic algorithms on graphs: depth first and breadth first search
Week 12	Lab 14: Sorting Algorithms
Week 13	Lab 15: Searching Algorithms
Week 14	Lab 13: Dijkstra's algorithm. Priority queues
Week 15	Project Submission



Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
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Required Texts	1. Clifford A. Shaffer (2009). A Practical Introduction to Data Structures and Algorithm Analysis(3rd) , Prentice Hall 2. MICHAEL MCMILLAN.(2007). DATA STRUCTURES AND ALGORITHMS USING C#. Michael McMillan 2007 3. Granville Barnett, and Luca Del Tongo (2008). Data Structures and Algorithms: Annotated Reference with Examples(1st)	No
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	Computation Theory		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☒ Practical ☒ Seminar
Module Code	HUC-CS203		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGII	Semester of Delivery	
Administering Department	CSIT	College	CS
Module Leader	Zaid Sami Mohsen	e-mail	zaid_sami@hilla-unc.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MSC
Module Tutor	Zaid Sami Mohsen	e-mail	zaid_sami@hilla-unc.edu.iq
Peer Reviewer Name	Non	e-mail	...
Scientific Committee Approval Date	16/9/2025	Version Number	V1

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



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives

أهداف المادة الدراسية

Finite automata are useful models for many important kinds of hardware and software. Here are the most important kinds:

- Software for designing and checking the behavior of digital circuits;
- The “lexical analyzer” of a typical compiler, that is, the compiler component that breaks the input text into logical units, such as identifiers, keywords, and punctuation.
- Software for scanning large bodies of text, such as collections of Web pages, to find occurrences of words, phrases, or other patterns;
- Software for verifying systems of all types that have a finite number of distinct states, such as communication protocols or protocols for secure exchange of information.

Module Learning Outcomes

مخرجات التعلم للمادة الدراسية

This module introduces the theory of computation through a set of abstract machines that serve as models for computation - finite automata, pushdown automata, and Turing machines - and examines the relationship between these automata and formal languages.

Additional topics beyond the automata classes themselves include deterministic and nondeterministic machines, regular expressions, context free grammar. After taking the course, you will:

- Define what a Regular Language is and construct a finite state machine for it.
- Construct equivalent representations among Regular Languages, Regular Expressions, and Regular Grammars.
- Formulate a grammar defining the syntax of common programming languages.
- Define the role of a Grammars in formal language generation.
- Construct equivalent suitable machine of each grammar type.
- Formulate a grammar defining the syntax of common programming languages.



Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A – Automata Theory [50 hrs] The word automaton itself, closely related to the word "automation", denotes automatic processes carrying out the production of specific processes. Simply stated, automata theory deals with the logic of computation with respect to simple machines, referred to as automata. Through automata, computer scientists are able to understand how machines compute functions and solve problems and more importantly, what it means for a function to be defined as <i>computable</i> or for a question to be described as <i>decidable</i>. There are four major families of automaton: ▪ Finite-state machine [15hrs] ▪ Pushdown automata [15 hrs] ▪ Linear-bounded automata [10 hrs] ▪ Turing machine [10 hrs] Part B - Formal Language theory and Grammar [40 hrs] ▪ Definition of a language [10 hrs] ▪ Chomsky hierarchy [10 hrs] ▪ Types of languages [10 hrs] ▪ Type of Grammar [10 hrs] Part C – Computability and Complexity theory [30 hrs] ▪ Computability theory deals primarily with the question of the extent to which a problem is solvable on a computer. [15 hrs] ▪ Complexity theory considers not only whether a problem can be solved at all on a computer, but also how efficiently the problem can be solved. Two major aspects are considered: time complexity and space complexity, which are respectively how many steps does it take to perform a computation, and how much memory is required to perform that computation. [15 hrs]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Throughout the module, it is important to employ effective learning and teaching strategies to ensure students grasp the concepts and develop the necessary skills. The main strategy that will be adopted in delivering this module: 1. Giving lectures. 2. Practical Exercises: Provide students with opportunities to practice their skills through practical exercises as a basic concept implementation 3. Conducting theoretical exams. 4. Request a report from students to teach them how to do research on a specific topic. 5. Request some small projects from student groups of real-world examples and case studies to demonstrate the relevance and impact of computation theory.

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب ل ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	30	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	90	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	120		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	15% (15)	5, 10, and 12	CL: 2,3 and 9,10 and 12
	Assignments	2	10% (10)	2 and 12	CL: 6 and 11
	Projects / Pr.	2	10% (10)	6 and 9	CL: 2,3 ,4 and 8
	Seminar	1	5% (5)	15	CL: 3,4,5,6,10 and 14
Summative assessment	Midterm Exam	2hr	10% (10)	6	CL:1 - 5
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction - Introduction to computation theory (Automata, computability, and complexity)
Week 2	Basics of language (alphabet, string, set, operations)
Week 3	Regular Languages and Finite Automata
Week 4	Regular Expression



Week 5	Non-Regular Languages
Week 6	Mid-term Exam
Week 7	Introduction to Grammars
Week 8	Context-Free Grammars; Regular Grammars; Parse Trees.
Week 9	Ambiguity in Grammars and Languages.
Week 10	Simplification of Context-free Grammars
Week 11	Standard Forms; Chomsky Normal Forms
Week 12	Pushdown Automata (PDA)
Week 13	The Turing Machine
Week 14	Applications with AI
Week 15	Seminar Discussion
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	[1] M. R. Garey and D. S. Johnson, Computers and Intractability: a Guide to the Theory of NP-Completeness. Freeman, 1979. [2] J. E. Hopcroft and J. D. Ullman, Introduction to Automata Theory, Languages, and Computation. Addison-Wesley, 1979. [3] H. R. Lewis and C. H. Papadimitriou, Elements of the Theory of Computation. Prentice-Hall, 1981. [4] Sipser, Michael. Introduction to the Theory of Computation. 3rd ed. Cengage Learning, 2012. ISBN: 9781133187790.	Yes
Recommended Texts	[5] John Martin, Introduction to Languages and the Theory of Computation, Fourth edition, 2006.	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
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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	Probability and Statistics		Module Delivery	
Module Type	Basic		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	HUC-CSIT201			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	UGII	Semester of Delivery		3
Administering Department	CS	College	HUCCS	
Module Leader	Hussein Abdel Wasi		e-mail	mathman1972@gmail.com
Z' AQW21	Lecturer	Module Leader's Qualification	Ph.D.	
Module Tutor	Hussein Abdel Wasi		e-mail	mathman1972@gmail.com
Peer Reviewer Name	Non	e-mail	...	
Scientific Committee Approval Date	16/9/2025	Version Number	V1	

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



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	The course aims to give the basics of statistics and study the permutations and combinations of different choices. In this topic, he studies the finding of the prevarications for different events resulting from conducting several experiments, as well as studying the probability functions of both types, intermittent and continuous, and different probability distributions.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A- Cognitive goals A1- Know the basic concepts of statistics A2- Knowing how to calculate permutations and combinations A3- Knowing how to find and calculate probabilities A4- Know the types of probabilistic functions and the probability distributions of the variables B - The soft skills objectives of the course. B1 - Students' knowledge of calculating and arranging data using statistical methods B2 - How to find and calculate probabilities
Indicative Contents المحتويات الإرشادية	Introduction to Statistics (50 hrs) set theory (20 hrs) Introduction to probabilities (50 hrs)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The lecturer's strategy is to give lectures and conduct short tests with the adoption of giving open assignments and grades as encouragement to students.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب ل ١٥ اسبوعا



Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	30	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	90	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	120		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2hr	30	5 , 10	
	Assignments	2hr	10	every 3 weeks	
	Projects / Pr.				
	Seminar				
Summative assessment	Midterm Exam	2hr	10% (10)	10	
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Statistics
Week 2	Frequency tables and charts
Week 3	Statistical operations
Week 4	Permutations and combinations
Week 5	set theory
Week 6	Introduction to probabilities
Week 7	Definitions of probability



Week 8	Random experiment, event, and sample space
Week 9	probability rules
Week 10	Conditional probability
Week 11	Independent and non-independent events
Week 12	Random variables, both discrete and continuous
Week 13	Discrete probability functions
Week 14	Continuous probability functions
Week 15	Discrete probability distributions
Week 16	Continuous probability distributions

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts		
Recommended Texts	1- Introduction to Probability and Statistics Using R 2- Permutations and combinations. 3- All statistics and probability books are useful for this article	
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	Object Oriented Programming		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☒ Practical ☒ Seminar	
Module Code	HUC-CS204			
ECTS Credits	7			
SWL (hr/sem)	175			
Module Level	UGII	Semester of Delivery		3
Administering Department	CS	College	HUCCS	
Module Leader	Ali Faris Razzaq		e-mail	ali.faris@hilla-unc.edu.iq
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	M.S.c.
Module Tutor	Ali Faris Razzaq		e-mail	ali.faris@hilla-unc.edu.iq
Peer Reviewer Name	Non		e-mail	...
Scientific Committee Approval Date	16/9/2025		Version Number	V1

(Signature)

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CS104	Semester	2
Co-requisites module	Non	Semester	...



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	Training the student on a set of advanced concepts in object oriented programming 1. The skills of performing mathematical, logical and relational operations on entities. 2. The skills of using the concept of inheritance in solving various problems. 3. The skills of how to write functions and build classes that operate on different types of data. 4. The skills of writing small projects and how to structure them, taking advantage of entity programming. 5. Formulating the ideas put forward into practical projects aimed at solving a problem in society. 6. The ability to acquire knowledge derived from practical experience. 7. The student's ability to deliver and theorize his idea to a group of audience. 8. The ability to complete all projects related to computer programming assigned to the graduate in his work circles
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Learn about the basics and principles of entity programming and the benefits of entity programming. 2. Learn how to build the class, the members types inside the class (private, protected and public) 3. Object-oriented idioms for encapsulation (Privacy, data hiding, and visibility of class members) 4. How to write the constructor and destructor functions and the different between constructor type functions 5. Learn the principle of polymorphism by learning a topic overloading and operator overloading functions 6. Learn how to create and define entities dynamically during execution time, how to define an array of entities, and learn about the benefits of dynamic booking. 7. How to use and employ inheritance to solve various problems. 8. Build a simple class hierarchy utilizing subclassing that allows code to be reused for distinct subclasses. 9. Learn about the different type of class inheritance (multiple, multilevel, hierarchical etc.) 10. Use constructor and destructor functions with the inheritance. 11. Learn about virtual functions. 12. Writing a single function or class that works on different types of data 13. Learn about exception handling.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. part A- encapsulation - [35 hour]. part B-



	polymorphism - [40 hour] part c- inheritance - [35 hour] part d- dynamic allocation - [20 hour] exception handling - [15 hour]
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Throughout the module, it is important to employ effective learning and teaching strategies to ensure students grasp the concepts and develop the necessary skills. The main strategy that will be adopted in delivering this module: 1. Giving lectures. 2. Practical Exercises within the laboratories: Provide students with opportunities to practice their skills through practical exercises. 3. Conducting theoretical exams. 4. Request a report from students to teach them how to do research on a specific topic. 5. Request some small projects from student groups of real-world examples and case studies to demonstrate the relevance and impact of object oriented programming.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	90	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	55	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	145		

Module Evaluation

تقييم المادة الدراسية

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

	Projects / Pr.	4	10%(10)	4,8,11 and 15	All
	Seminar	1	5%(5)	15	7 to 13
Summative assessment	Midterm Exam	2hr	10% (10)	8	1 to 6
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction To OOP & Definition Of Class
Week 2	Private, Protected and Public Members
Week 3	Constructors and Destructor Functions
Week 4	Overloading Functions
Week 5	Operator Overloading Functions
Week 6	Friend Functions
Week 7	Dynamic & Static Objects
Week 8	Mid Exam
Week 9	Introduction To Inheritance
Week 10	Types Of Inheritance
Week 11	Constructors & Destructor Functions With Inheritance
Week 12	Virtual Functions
Week 13	Template Functions And Classes
Week 14	Exception Handling
Week 15	Seminar Discussion
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Design and implementation simple Classes
Week 2	Private, Protected and Public Members
Week 3	Constructors and Destructor Functions
Week 4	Overloading Functions



Week 5	Operator Overloading Functions
Week 6	Friend Functions
Week 7	small project discussion
Week 8	Dynamic & Static Objects
Week 9	Introduction To Inheritance
Week 10	Types Of Inheritance
Week 11	Constructors & Destructor Functions With Inheritance
Week 12	Virtual Functions
Week 13	small project discussion
Week 14	Template Functions And Classes
Week 15	Exception Handling

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	the complete reference c++ fourth edition , Herbert schildt	
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

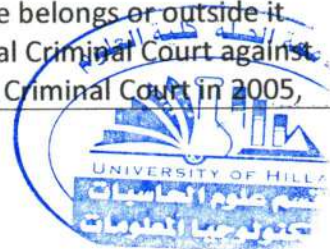
نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Baath Crimes		Module Delivery
Module Type	Support		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	HUC-UOK205		
ECTS Credits	2		
SWL (hr/sem)	60		
Module Level	UGII	Semester of Delivery	
Administering Department	HUC	College	CSIT
Module Leader	Athraa Abdullah Hashi	e-mail	adhraa_abdullah@hilla-unc.edu.iq
Module Leader's Acad. Title	Assist Lecturer	Module Leader's Qualification	
Module Tutor	Athraa Abdullah Hashi	e-mail	adhraa_abdullah@hilla-unc.edu.iq
Peer Reviewer Name	Non	e-mail	...
Scientific Committee Approval Date	16/9/2025	Version Number	V1

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1- Enabling the student to identify the types of crimes committed within him The state and distinguishing between it and crimes against humanity by identifying its characteristics, foundations, and the laws that apply to it. 2- Enabling the student to become familiar with local and international laws, especially Which deals with human rights issues and violations committed against them, and raises the level of his legal culture that enables him to adopt it to reject those violations. Whether within the state system to which he belongs or outside it. 3-Introduction to the laws of the International Criminal Court against humanity, and the laws of the Iraqi Supreme Criminal Court in 2005,
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Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. _Understanding the history of the Baath Party_: The ability to describe the history, goals, and methods of the Baath Party. 2. _Knowledge of the crimes of the Baath Party_: The ability to identify and explain the crimes of the Baath Party, such as murder, torture, and intimidation. 3. _Understanding the impact of the crimes of the Baath Party on society_: The ability to explain the crimes of the Baath Party on society, such as destruction, destruction, and poverty. 4. _Knowledge of the role of international organizations in combating the crimes of the Baath Party_: The ability to describe the role of international organizations, such as the United Nations, in combating the crimes of the Baath Party. 5. _Understanding the importance of justice and accountability_: The importance of explaining the importance of the court and accountability in combating the crimes of the mission. 6. _Knowledge of the role of witnesses and victims in combating the crimes of the Baath Party_: The ability to describe the role of witnesses and victims in combating the crimes of the Baath Party. 7. _Understanding the impact of the crimes of the Baath Party on human rights_: The ability to explain the crimes of the Baath Party on human rights, such as the right to life, freedom, and dignity. 8. _Knowledge of the role of awareness and education in preventing Baath Party crimes_: The ability to describe the role of awareness and education in preventing Baath Party crimes. 9. _Understand the importance of international cooperation in combating Baath Party crimes_: The importance of explaining the importance of international cooperation in combating Baath Party crimes. 10. _Knowledge of the role of non-governmental organizations in combating Baath Party crimes_: The ability to describe the role of non-governmental organizations in combating Baath Party crimes.
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Methodical Books/Book of Crimes of the Baath Regime in Iraq (Iraq, Ministry of Higher Education and Scientific Research, 2023)



	Main sources / - Dr. Ghassan Karim Al-Majjab and Zine El Abidine Tohme, Human Rights and Democracy, 2018. Zuwaina Al-Walid, The Crime of Genocide in Light of the Jurisprudence of the International Criminal Court For Rwanda, unpublished master's thesis, (University of Algiers, Faculty of Law, Ben Aknoun, 2013) - The Constitution of Iraq of 2005
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Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	٣٠	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	٢
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	٤٠	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	٣
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	٧٠		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	15% (15)	5, 10, and 12	CL: 2,3 and 9,10 and 12
	Assignments	2	10% (10)	2 and 12	CL: 6 and 11
	Seminar	2	10% (10)	6 and 9	CL: 2,3 ,4 and 8
Summative assessment	Midterm Exam	2hr	10% (10)	15	CL: 3,4,5,6,10 and 14
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

	Material Covered
Week 1	The concept and definition of crimes and their categories
Week 2	The position of the Iraqi Supreme Criminal Court Law of 2005 regarding the violations of the Baath regime The most important decisions issued by it



Week 3	Types of international crimes
Week 4	The role of the Baath regime in psychological violations and their resulting effects
Week 5	The role of the Baath regime in social violations and their resulting effects
Week 6	The position of the Baath regime Of religion and institutions Religious
Week 7	The role of the Baath regime was violated Rights laws man
Week 8	Violations of the Baath regime Political and military
Week 9	Violations of the Baath regime For the environment in Iraq/war pollution
Week 10	The Baath regime's violations of the environment In Iraq/Destruction of cities and villages
Week 11	The Baath regime's violations of the environment In Iraq/Drying marshes and orchards
Week 12	Legal and legitimate adjustment For the crime of mass graves
Week 13	The role of the Baath regime in the events Mass graves in Iraq
Week14-15	Exam

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	Microprocessors		Module Delivery
Module Type	Basic		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☒ Seminar
Module Code	HUC-CSIT202		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGII	Semester of Delivery	4
Administering Department	CS	College	HUC
Module Leader	Hadeel Talib Mangi	e-mail	hadeel_talib@hilla-unc.edu.iq
Module Leader's Acad. Title	Assistant LECTER	Module Leader's Qualification	MS.C
Module Tutor	Hadeel Talib Mangi	e-mail	hadeel_talib@hilla-unc.edu.iq
Peer Reviewer Name	Non	e-mail	...
Scientific Committee Approval Date	16/09/2025	Version Number	V1



Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CS101	Semester	1
Co-requisites module	Non	Semester	...

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	Understand the fundamentals: Gain a solid understanding of the basic principles and concepts of microprocessors, including their architecture, organization, and operation. Learn assembly language programming: Acquire skills in programming microprocessors using assembly language, including instruction set architecture, addressing modes, and assembly language programming techniques. Study microprocessor architecture: Explore the internal architecture of microprocessors, including the various components such as registers, arithmetic logic units (ALUs), control units, and memory interfaces. Understand input/output (I/O) operations: Learn about the mechanisms for input and output operations in microprocessors, including I/O ports, memory-mapped I/O, interrupt handling, and interfacing with peripheral devices.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A comprehensive understanding of microprocessor architecture, organization, and operation, including the roles of various components and their interactions. Apply programming skills: Develop proficiency in programming microprocessors using assembly language and/or high-level languages, effectively utilizing instruction sets, addressing modes, and programming techniques.
 Indicative Contents المحتويات الإرشادية	Introduction to Microprocessors: [30 hrs] • Evolution and history of microprocessors • Basic components and architecture of a microprocessor • Von Neumann and Harvard architectures Microprocessor Organization and Instruction Set: [40 hrs] • Registers and memory organization • Data types and data representation • Instruction set architecture (ISA) • Addressing modes and instruction formats Microprocessor Architecture: [30 hrs] • Central Processing Unit (CPU) organization • Arithmetic Logic Unit (ALU) and data operations • Control unit and instruction execution Input/Output (I/O) Operations: [20 hrs] • I/O interfaces and I/O ports • Memory-mapped I/O

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	various strategies can be employed to facilitate effective learning and engagement. Here are some learning and teaching strategies commonly used, Lectures: Delivering lectures to present theoretical concepts, principles, and foundational knowledge. Interactive Discussions: Encourage students to actively participate in discussions by asking questions, sharing their thoughts, and engaging in peer-to-peer learning. Discussions can focus on challenging concepts. Hands-on Lab Sessions: Conduct practical lab sessions where students can gain hands-on experience. Assessments and Feedback: Use a variety of assessment methods such as quizzes, assignments, projects, and exams to evaluate students' understanding
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	60	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	120		



Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5,13	(1-5) and (6-13)
	Assignments	1	10% (10)	14	All
	Projects / Lab.	1	10% (10)	10	All
	Projects / Pr.	1	10% (10)	15	All
	Seminar				
Summative assessment	Midterm Exam	2hr	10% (10)	8	(1-7)
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Microprocessor Intel 8086
Week 2	Bus interface system
Week 3	The operations of a CPU and memory
Week 4	Microprocessor Architecture
Week 5	Central Processing Unit (CPU) organization, Arithmetic Logic Unit (ALU) and data operations, Control unit and instruction execution
Week 6	Memory Segmentation, Physical Address and Flag Register
Week 7	Addressing modes in 8086
Week 8	Midterm Exam
Week 9	System Components for the Intel 8086
Week 10	Input/Output (I/O) Operations, I/O interfaces and I/O ports, Memory-mapped I/O
Week 11	Instructions divided into 6 groups: 1. Data transfer instructions 2. Arithmetic instructions 3. Logic instructions
Week 12	4. Shift instructions 5. Rotate instructions 6. Advance instructions
Week 13	Arithmetic instructions
Week 14	Logical, Shift and Rotate instructions
Week 15	Control Transfer Group



Week 16	Preparatory week before the final Exam
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Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Register types
Week 2	Data transfer instructions
Week 3	Data transfer instructions
Week 4	Arithmetic instructions
Week 5	Arithmetic instructions
Week 6	Logic instructions
Week 7	Midterm Exam
Week 8	Shift instructions
Week 9	Rotate instructions
Week 10	Advance instructions
Week 11	Control Transfer Group
Week 12	conditional and unconditional JUMP
Week 13	Writing a small program in 8086 MPU
Week 14	Writing a program in 8086 MPU using all instructions
Week 15	Writing a program in 8086 MPU using conditional instructions



Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Microprocessor 8086 : Architecture, Programming and Interfacing	
Recommended Texts	Intel 8086 MICROPROCESSOR ARCHITECTURE	

Websites	https://www.shahucollegelatur.org.in/Department/Studymaterial/sci/compsci/intelarchitecture.pdf
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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 Analysis and Design		Module Delivery
Module Type	Elective		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☒ Seminar
Module Code	HUC-CS208		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGII	Semester of Delivery	4
Administering Department	CS	College	College of science
Module Leader	Ashraf Farhan Hatem	e-mail	ashraffarha n225@ hilla-unc.edu.iq
Module Leader's Acad. Title	Asst. Teacher	Module Leader's Qualification	MSC
Module Tutor	Ashraf Farhan Hatem	e-mail	ashraffarha n225@ hilla-unc.edu.iq
Peer Reviewer Name	Non	e-mail	...
Scientific Committee Approval Date	16/09/2025	Version Number	V1



Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Non	Semester	...
Co-requisites module	Non	Semester	...

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	The main aim of teaching Systems Analysis and Design (SAD) is to learn new techniques and approaches to develop systems more effectively and efficiently. However, there is a core set of skills that all analysts need to know no matter what approach or methodology is used. All information systems projects move through the four phases of planning, analysis, design, and implementation; all projects require analysts to gather requirements, model the business needs, and create blueprints for how the system should be built; and all projects require an understanding of organizational behavior concepts like change management and team building.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	It is very important and necessary for a computer science student to learn systems analysis and design by learning some modern methods and methods for building and developing systems, software and applications. It is a necessary requirement for the student to learn many necessary and important skills that will increase the student's ability to analyze and design advanced systems.
 Indicative Contents المحتويات الإرشادية	The purpose of this course is to familiarize students with concepts, methods, and tools for object-oriented analysis and design of software systems, with emphasis on methods applied in large product development projects. The course introduces common design principles and patterns that support the development of maintainable, reusable and extensible software. The course gives an introduction to UML.(40 hrs) Analysis- and design models are expressed using UML models such as use case diagrams, class diagram, sequence diagrams, and state diagrams. Furthermore, techniques and guidelines are introduced for analysis of software domain and requirements.(40 hrs) Prerequisites and selection Requirements To be eligible for this course, students must have successfully completed an object-oriented programming course (for example Object-Oriented Programming, one semester at least).(40 hrs)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The module will be delivered through lectures and tutorials. The tutorials will be used to solve problems in the design and analysis of software. The oral conversation could be considered a good learning way as well as think pair share, discussion, and presentation methods
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	60	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	120		



Module Evaluation

تقييم المادة الدراسية

	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	1.2.5
	Assignments	1	10% (10)	Continuous
	Projects / Lab.	1	10% (10)	
	Projects / Pr.			
	Seminar		10% (10)	
Summative assessment	Midterm Exam	2hr	10% (10)	
	Final Exam	3hr	50% (50)	17
Total assessment			100% (100 Marks)	All

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	THE SYSTEMS ANALYST AND INFORMATION SYSTEMS DEVELOPMENT
Week 2	PROJECT SELECTION AND MANAGEMENT
Week 3	REQUIREMENTS DETERMINATION
Week 4	USE CASE ANALYSIS
Week 5	PROCESS MODELING
Week 6	DATA MODELING
Week 7	MOVING INTO DESIGN
Week 8	ARCHITECTURE DESIGN
Week 9	USER INTERFACE DESIGN
Week 10	PROGRAM DESIGN
Week 11	DATA STORAGE DESIGN
Week 12	MOVING INTO IMPLEMENTATION
Week 13	TRANSITION TO THE NEW SYSTEM
Week 14	TRANSITION TO THE NEW SYSTEM
Week 15	THE MOVEMENT TO OBJECTS
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	UML (Unified Modeling Language) introduction
Week 2	UML (Overview)
Week 3	UML - Building Blocks
Week 4	UML - Architecture
Week 5	UML - Modeling Types
Week 6	UML - Basic Notations
Week 7	UML - Standard Diagrams
Week 8	UML - Class Diagram
Week 9	UML - Object Diagrams
Week 10	UML - Component Diagrams



Week 11	UML - Deployment Diagrams
Week 12	UML - Use Case Diagrams
Week 13	UML - Interaction Diagrams
Week 14	UML - Statechart Diagrams
Week 15	UML - Activity Diagrams

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	SYSTEM ANALYSIS AND DESIGN, Fifth Edition by ALAN DENNIS	
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	Artificial Intelligence		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☒ Seminar
Module Code	HUC-CS205		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGII	Semester of Delivery	
Administering Department	CS	College	HUCCS
Module Leader	م.م. شهد رائد هادي	e-mail	shahed.raed@hilla-unc.edu.iq
Module Leader's Acad. Title	Asst. Teacher	Module Leader's Qualification	MSc.
Module Tutor	م.م. شهد رائد هادي	e-mail	shahed.raed@hilla-unc.edu.iq
Peer Reviewer Name	Non	e-mail	...
Scientific Committee Approval Date	17/12/2025	Version Number	V1

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



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Provide a solid understanding of AI fundamentals, theories, and techniques. 2. Develop practical skills to apply AI methodologies in solving real-world problems. 3. Enhance programming abilities and familiarity with AI programming languages. 4. Foster critical thinking and analysis in evaluating AI algorithms and models. 5. Cultivate collaboration and communication skills through team projects. 6. Encourage staying updated with the latest developments and trends in AI.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Identify and describe different types of intelligent agents. 2. Identify the characteristics and effectiveness of AI algorithms. 3. Apply and compare different knowledge representations under different scenarios. 4. Formulate problems creatively as AI problems.
Indicative Contents المحتويات الإرشادية	1. Artificial Intelligence and Intelligent Agents: Test of the existing intelligence, such as Turing test Agents, environment, and the structure of agents. 2. Problem Solving by Searching: Problem-solving agents, the concept of state space, uninformed search strategies, heuristic search and A* algorithm, local search algorithms, searching with partial observations. 3. Adversarial Search Algorithms: Optimal decisions in games, Alpha-Beta pruning, stochastic games, partially observable games, game programs. 4. Constraint Satisfaction Problems: Definition of Constraint Satisfaction Problems (CSPs), constraint propagation, local search for CSPs. 5. Knowledge Representations and Reasoning: Propositional logic, propositional theorem proving, agents based on propositional logic, first order logic, forward chaining, backward chaining, expert systems, probabilistic knowledge representation and probabilistic reasoning.



Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	There are a number of teaching and learning activities, including lectures, laboratories, group projects, and presentations. The concepts and principles of intelligent agents, AI algorithms, knowledge representations, reasoning, and emergent computational intelligence will be covered in lectures. Artificially intelligent software will be taught in the laboratories. Students are required to perform a group project to apply the concepts and principles covered in this course to analyze real-world problems and formulate them as AI problems.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	85	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6

Total SWL (h/sem)	145
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	CL: 2,3 and 9,10
	Assignments	2	5% (5)	2 and 12	CL: 6 and 11
	Projects / Lab.	1	10% (10)	Continuous	All
	Projects / Pr.	2	10% (10)	6 and 15	CL: 3,5 and 12, 13
	Seminar	1	5% (5)	14	CL: 7, 11, 13
Summative assessment	Midterm Exam	2hr	10% (10)	8	CL: 1 – 7
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Artificial Intelligence
Week 2	Intelligent Agents
Week 3	Problem Solving by Searching
Week 4	Search Algorithms
Week 5	Heuristic Search Techniques
Week 6	Adversarial Search Algorithms
Week 7	Minimax Algorithm , Alpha-Beta Pruning
Week 8	Evaluation Functions and Game Tree Optimization
Week 9	Midterm Exam
Week 10	Constraint Satisfaction Problems

Week 11	Forward Checking and Constraint Propagation
Week 12	Arc Consistency and Constrained Optimization
Week 13	Knowledge Representations and Reasoning
Week 14	Logic-based Knowledge Representation
Week 15	Reasoning Methods and Inference Engines
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to Python Programming(Python-Data Type) via implement the tic tac toe game
Week 2	Lab 2: Implement agents and environments
Week 3	Lab 3: Simple Agent Based Model In Python
Week 4	Lab 4: Graph Representation and Drawing in Python
Week 5	Lab 5: Search Algorithms(Uninformed search methods)
Week 6	Lab 6: Search Algorithms(Informed search methods)
Week 7	Lab 7: Eight Puzzle problem in python
Week 8	Lab 8: Practical Discussion-1 (small project)
Week 9	Lab 9: Constraint Satisfaction Problems(CSP)
Week 10	Lab 10: CSP Backtracking Search, Arc_consistency
Week 11	Lab 11: Map Coloring Problem
Week 12	Lab 12: N-Queen , Sudoku problems
Week 13	Lab 13: Knowledge Representation using Propositional Logic In Python
Week 14	Lab 14: Knowledge Representation using First Order Logic In Python
Week 15	Lab 15: Practical Discussion-2 (small project)



Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Russell, Stuart J., and Norvig, Peter. Artificial Intelligence : A Modern Approach. 4th Edition. Prentice Hall Series in Artificial Intelligence. Upper Saddle River, N.J.: Prentice Hall, 2021.	Yes
Recommended Texts	1. Padhy, N. P. (2005). Artificial Intelligence and Intelligent Systems. New Delhi: Oxford University Press. 2. D. L. Poole and A. K. Mackworth, "Artificial Intelligence: Foundations of Computational Agents." Cambridge University Press, 2017. 3. G. F. Luger, "Artificial Intelligence: Structures and Strategies for Complex Problem Solving." Pearson, 2019. 4. M. Negnevitsky, "Artificial Intelligence: A Systems Approach." Pearson, 2019.	Yes
Websites	1. https://aima.cs.berkeley.edu/ 2. https://learn.stanford.edu/GoogleAI.html?gad=1&gclid=CjwKCAjwkLCkBgA9EiwAka9QRrAyFm9JyX9ziawWwuheu7qEdhMXjp-L4sH8KC2JtrNRpzb8R8edpxoCcakQAvD_BwE	

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Algorithm Design and Analysis		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☒ Seminar	
Module Code	HUC-CS206			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	UGII	Semester of Delivery		4
Administering Department	CS	College	HUCCS	
Module Leader	Muhannad Muhammad Jassim	e-mail	muhannad_al_yasiry@uobabylon.edu.iq	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.	
Module Tutor	Muhannad Muhammad Jassim	e-mail	muhannad_al_yasiry@uobabylon.edu.iq	
Peer Reviewer Name	Non	e-mail	Non	
Scientific Committee Approval Date	16/9/2025	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CS201	Semester	3
Co-requisites module	Non	Semester	...



Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. understanding the general principle of writing algorithms, design algorithms and its benefits. 2. Introducing types of algorithms and the applying them 3. identifying applications related to the algorithms and other fields of knowledge
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understanding of Fundamental Algorithms: Students should acquire a solid understanding of fundamental algorithms and their associated data structures 2. Algorithm Design Techniques: Students should become familiar with various algorithm design paradigms and techniques 3. Analyzing Algorithm Complexity: Students should learn techniques to analyze the complexity of algorithms, including time complexity (measured in terms of Big O notation) and space complexity 4. Algorithmic Problem Analysis: Students should be able to critically analyze existing algorithms and identify their strengths, weaknesses, and limitations 5. Problem-Solving Skills: The course aims to enhance students' problem-solving abilities by exposing them to a wide range of algorithmic problems 6. Collaboration and Communication: The course may emphasize the importance of teamwork, collaboration, and effective communication in algorithm design and analysis 7. Algorithmic Thinking and Creativity: Students should cultivate algorithmic thinking skills and develop creative approaches to problem-solving. 8. Algorithm Implementation: Students should gain proficiency in implementing algorithms in a programming language of choice
Indicative Contents المحتويات الإرشادية	When designing and analyzing an algorithm, there are several key components that should be considered. While the specific contents may vary depending on the nature of the algorithm and the context in which it is being used, here are some indicative contents typically found in algorithm design and analysis: 

Part A – Algorithm Design and Analysis principles

1. Introduction to Algorithm Design and Analysis [10 hrs]
2. Problem Statement: Clearly define the problem that the algorithm is intended to solve. Describe the input and output requirements, as well as any constraints or assumptions. [10 hrs]

Part B – Algorithm Design

1. Algorithm Description: Provide a high-level description of the algorithm, outlining the steps and operations involved in solving the problem. This description should be concise and easy to understand. [10 hrs]
2. Pseudocode/Flowchart: Present the algorithm in a more detailed manner using pseudocode or a flowchart. This step-by-step representation helps in understanding the logical flow of the algorithm and can aid in implementation. [15 hrs]

Part C – Algorithm Analysis

1. Time Complexity Analysis: introduction to Analysis of the algorithm's efficiency in terms of time complexity. Determine how the algorithm's running time grows with respect to the input size. [15 hrs]
2. sorting algorithms (e.g., insertion sort, merge sort, quicksort)
3. searching algorithms (e.g., binary search) [15 hrs]
4. graph algorithms (e.g., breadth-first search, depth-first search) [15 hrs]
5. measure the time complexity in terms of Big O notation, Omega and Theta notation [15 hrs]
6. Space Complexity Analysis: Evaluate the algorithm's memory usage or space complexity. Determine how the algorithm's space requirements grow with respect to the input size. This analysis involves assessing the additional memory used by data structures, variables, and recursive calls. [15 hrs]



Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Throughout the module, it is important to employ effective learning and teaching strategies to ensure students grasp the concepts and develop the necessary skills. The main strategy that will be adopted in delivering this module: Giving lectures. Practical Exercises within the laboratories: Provide students with opportunities to practice their skills through practical exercises. Conducting theoretical exams. Request a report from students to teach them how to do research on a specific topic. Request some small projects from student groups of real-world examples and case studies to demonstrate the relevance and impact of Algorithm Design and analysis.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	60	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	120		

Module Evaluation

تقييم المادة الدراسية

	Time/Number	Weight (Marks)	Week Due Relevant Learning
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					Outcome
Formative assessment	Quizzes	1	5% (5)	5	
	Report/ attends	2	10% (10)	4 and 9	
	Projects / Lab.	2	12% (12)	Continuous	
	Projects / Pr.	1	3% (3)	11	
	Seminar	1	10% (10)	12	
Summative assessment	Midterm Exam	2hr	10% (10)	8	
	Final Exam	3hr	50% (50)	15	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Algorithm Analysis and Design
Week 2	Design of Algorithm
Week 3	Introduction to Space complexity
Week 4	Identifying differences among best, average, and worst case Behaviors
Week 5	Introduction to Time Complexity
Week 6	Time Complexity Analysis of Recursive functions
Week 7	Asymptotic Notation
Week 8	Midterm Exam
Week 9	Sorting algorithm (selection sort, merged sort)
Week 10	Divide-and-conquer Techniques (quick sort)
Week 11	Sequential search
Week 12	Binary search algorithms
Week 13	Seminar Discussion
Week 14	Seminar Discussion
Week 15	Preparing for final

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Programming fundamentals, coding different simple algorithms



Week 2	Lab 2: Design of Algorithms
Week 3	Lab 3: compute Space complexity for algorithm
Week 4	Lab 4: compute Time Complexity for normal functions
Week 5	Lab 5: Time Complexity Analysis of Recursive functions
Week 6	Lab 6: Brute-force algorithms
Week 7	Midterm Exam
Week 8	Lab 7: Divide-and-conquer Techniques (quick sort)
Week 9	Lab 8: Sequential and Binary search algorithms
Week 10	Lab 9: sorting algorithms (selection, Insertion)
Week 11	Lab 10: sorting algorithms (Merge sort)
Week 12	Lab 11 : Binary search trees (Building Tree and Insertion)
Week 13	Lab 12 : Binary search trees (Deletion)
Week 14	Practical Discussion-2 (small project)
Week 15	Practical Discussion-2 (small project)

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1. Clifford A. Shaffer (2009). A Practical Introduction to Data Structures and Algorithm Analysis(3rd) , Prentice Hall 2. MICHAEL MCMILLAN.(2007). DATA STRUCTURES AND ALGORITHMS USING C#. Michael McMillan 2007.	No
Recommended Texts	1. Granville Barnett, and Luca Del Tongo (2008). Data Structures and Algorithms: Annotated Reference with Examples(1st) 2. Dexter C. Kozen, The Design and Analysis	No



	of Algorithms, Copyright Springer_Verlager. Inc, 1990.	
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Data Management		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☒ Seminar
Module Code	HUC-CS207		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGII	Semester of Delivery	
Administering Department	CSIT	College	CS
Module Leader	Zaid Sami Mohsen	e-mail	zaid_sami@hilla-unc.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MSC
Module Tutor	Zaid Sami Mohsen	e-mail	zaid_sami@hilla-unc.edu.iq
Peer Reviewer Name	Non	e-mail	...
Scientific Committee Approval Date		Version Number	V1

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CS202	Semester	3
Co-requisites module	Non	Semester	...



Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1- Understanding the principles and methods of designing relational databases, as well as to learn about the constraints in the database management system. 2- Exploring the process of organizing data in a database. This includes creating tables and establishing relationships between those tables according to rules designed both to protect the data and to make the database more flexible by eliminating redundancy and inconsistent dependency (Normalization)
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1.Introduction to the principles of relational database design by entity relational to relational mapping, their systems, and types. 2. Application of relational mapping algorithm. 3. Understanding the importance of database management systems. 4. Design a schema diagram for a database management system. 5. Ability to design relational database management systems. 6. Capability to deliver lectures on database management systems. 7. Proficiency in designing a database system. 8.Skill to manage dialogues and discussions related to database management systems.
Indicative Contents المحتويات الإرشادية	<u>Part A: Relational Database Design by ER-to-Relational Mapping</u> -ER-to-Relational Mapping Algorithm [10 hrs] -Mapping of Binary n:n Relation Types [10 hrs] -Foreign key to link two tables [10 hrs] -Redundant Information in Tuples and Update Anomalies [10 hrs] -Update Anomalies [10 hrs] <u>Part B: Functional Dependency (FD)</u> - Inference Rules for Functional Dependencies [15 hrs] -Inference Rules [15 hrs]



	- MySQL INNER JOIN Keyword [10 hrs] -MySQL LEFT, Right, self, and cross JOIN Keyword [10 hrs] <u>Part C: Introduction to Normalisation and Security database</u> -Database Normalization [15 hrs] -Types of normalisation [15 hrs] -Introduction to Database Security Issues [10 hrs] -Database Security and the DBA [10 hrs]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Using technology when giving lectures. 2. Provide the students with all the tools that will help them to carry out practical exercises within laboratories for databases 3. Provide the student with key vocabulary and help with database systems. 4. Asking the student to present a group seminar and design database systems. 5. Homework, Quizzes, Monthly theoretical and practical exams and Final exam. 6. Ask the student for scientific reports and group project 7. Asking the student and urging him to participate in scientific discussions. 8. Enhancing the student's self-confidence by praising him in front of his colleagues

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	85	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	145		



Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5%(5)	4 and 10	
	Assignments	1	5%(5)	7	
	Projects / Lab.	1	15%(15)	continues	
	Projects / Pr.	2	5% (5)	6 and 15	
	Seminar	1	5%(5)	13	
Summative assessment	Midterm Exam	2hr	10% (10)		
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Relational Database Design
Week 2	Relational Database Design by ER-to-Relational Mapping
Week 3	ER-to-Relational Mapping Algorithm
Week 4	Redundant Information in Tuples and Update Anomalies
Week 5	Functional Dependency (FD)
Week 6	Introduction Database Normalization
Week 7	First Normal form
Week 8	Midterm Exam
Week 9	Second Normal form
Week 10	Third Normal Form
Week 11	Introduction Database Security
Week 12	Database Security and the DBA



Week 13	DBA-privileged commands
Week 14	Precision VS Security
Week 15	Final Project Seminar
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المناهج الاسبوعي للمختبر	
	Material Covered
Week 1	Using Foreign key to link two tables
Week 2	MySQL INNER JOIN Keyword
Week 3	MySQL LEFT and Right JOIN Keyword
Week 4	Join Three Tables
Week 5	The MySQL CASE Statement
Week 6	The MySQL ANY Operators
Week 7	Midterm Exam
Week 8	MySql ALL Operators
Week 9	MySQL NULL Functions
Week 10	MySQL UNIQUE Constraint
Week 11	UNIQUE Constraint on ALTER TABLE
Week 12	Design and Implement small project1
Week 13	Design and Implement small project2
Week 14	Design and Implement small project3
Week 15	Project Discussion

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Elmasri, R., & Navathe, S. (2011). Fundamentals of database systems sixth edition pearson education. Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.	



Recommended Texts	Powell, G. (2006). <i>Beginning database design</i> . John Wiley & Sons.	
Websites	SQLCourse: Beginner & Advanced Interactive SQL Tutorials http://www.db-book.com https://www.w3schools.com/MySQL/default.asp	

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		Module Delivery	
Module Type	S		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	HUC-UOK201			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	2	Semester of Delivery		2
Administering Department	CS	College	HUCCS	
Module Leader	Ayad Hamza Shaheed		e-mail	gan162gna@gmail.com
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.	
Module Tutor	Ayad Hamza Shaheed		e-mail	gan162gna@gmail.com
Peer Reviewer Name	Name	e-mail	E-mail	
Scientific Committee Approval Date		Version Number	1.0	

(Handwritten signature)

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	- تعليم الطلبة على أساسيات اللغة العربية وقواعدها - تعليم الطلبة على كيفية الأعراب -
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- أن يتعرف الطالب على قواعد اللغة العربية - أن يعرف الطالب كيفية بناء الجمل واستخراجها للعنوان المطلوب - القدرة على استعمال العبارات الصحيحة - القدرة على مشاركة الآخرين في الحوار الصحيح
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	- مشاركة بالتحضير في قاعة الدرس - طريقة السئلة والجوبة في قاعة الدرس - ادارة المحاضرة عل نحو تطبيقي مرتبط بواقع الحياة اليومية - تكليف الطالب ببعض الأنشطة والواجبات

Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	50		

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.				

	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	20% (20)	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	العدد تذكيره وتأنيثه
Week 2	الاعداد المفردة والمركبة
Week 3	ألفاظ العقود والأعداد مئة ، ألف ، مليون
Week 4	تعريف العدد وتذكيره
Week 5	ما يصاغ من العدد على وزن فاعل
Week 6	كتابة الهمزة المتوسطة والمتطرفة
Week 7	امتحان
Week 8	كتابة الالف اللينة
Week 9	كتابة التاء المربوطة والمبسوطة
Week 10	كتابة الضاد والظاء
Week 11	اللامات وأنواعها
Week 12	الهاءات وأنواعها
Week 13	النونات وأنواعها
Week 14	استعمالات (ما ، من ، والفرق بين (أما ، إما)
Week 15	استعمالات (أن ، إن)
Week 16	الامتحان النهائي

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	قواعد اللغة العربية، يوسف الصيداوي	
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	Web Design and Programming		Module Delivery	
Module Type	Elective		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	HUC-CS304			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	UGIII	Semester of Delivery		5
Administering Department	CS	College	HUC-CS	
Module Leader	Ayat Nadum Kadhum		e-mail	ayat.nadhum@hilla-unc.edu.iq
Module Leader's Acad. Title	Assistant Lecturer		Module Leader's Qualification	MSC
Module Tutor	Ayat Nadum Kadhum		e-mail	ayat.nadhum@hilla-unc.edu.iq
Peer Reviewer Name	Non		e-mail	...
Scientific Committee Approval Date	16/9/2025		Version Number	V1

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	The overall course objective is to provide the knowledge and skills a student needs to build and maintain web pages using HTML, Cascading Styling Sheets (CSS) and JavaScript. The course progresses from introductory work on web design to designing and developing a website.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-Understand the basic principles of web design. 2-Gain the skills needed to create a functioning website using HTML, CSS and JavaScript. 3-Gain the necessary skills to manage and maintain websites. 4-Be familiar with the most popular editors used to design websites.
Indicative Contents المحتويات الإرشادية	1- Introduction to Web design [10] 2- HTML Language fundamentals. [50] 3- CSS fundamentals. [45] 4- JavaScript and How to create a dynamic webpage. [40]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Throughout the module, it is important to employ effective learning and teaching strategies to ensure students grasp the concepts and develop the necessary skills. The main strategy that will be adopted in delivering this module: 1. Giving lectures. 2. Practical Exercises within the laboratories: Provide students with opportunities to practice their skills through practical exercises. 3. Conducting theoretical exams. 4. Request a report from students to teach them how to do research on a specific topic. 5. Request projects from student groups of real-world examples.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	85	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	145		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 11	1,2,3
	Assignments	2	5% (5)	2 and 12	1,2,3
	Projects / Lab.	1	10% (10)	Continuous	All
	Projects / Pr.	3	15% (15)	7,12 and 15	All
	Seminar	-	-	-	
Summative assessment	Midterm Exam	2hr	10% (10)	7	
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		



Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction: -Brief History of Internet -What is World Wide Web -Why create a website -Basic principles involved in developing a web site.
Week 2	Introduction to HTML - What is HTML - HTML Documents - Basic structure of an HTML document - Creating an HTML document - Heading-Paragraphs - Line Breaks
Week 3	HTML tags and Elements
Week 4	HTML Lists and Tables.
Week 5	HTML Hyperlinks and Images.
Week 6	HTML Forms.
Week 7	Mid term Exam
Week 8	Introduction to Cascading Style Sheets (CSS) -CSS Syntax -Internal CSS & External CSS -CSS Styling(Background, Text Format, Controlling Fonts)
Week 9	CSS:

	-Color in CSS -Selectors -The Role of ID and Class in CSS
Week 10	CSS: -Working with block elements and objects -Working with Lists and Tables
Week 11	CSS Box Model(Introduction, Border properties, Padding Properties, Margin properties) , CSS Advanced(Grouping, Dimension, Display, Positioning, Floating, Align, Navigation Bar)
Week 12	Introduction to JavaScript -Language Syntax -Values and Variables
Week 13	JavaScript: -Basic Program Structure, Statements, Loops, etc
Week 14	JavaScript:Function Fundamentals
Week 15	JavaScript: DOM and Dynamic HTML
Week 16	Preparatory week before the final Exam

 Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	-Introduction to HTML Language. -Using Editors -Create an HTML Document.
Week 2	Create an HTML page with Headings and paragraphs
Week 3	Adding HTML tags and Elements such as <input>, <textarea> to HTML page
Week 4	Create a webpage with Lists and Tables.
Week 5	Create a website with Hyperlinks and Images.
Week 6	Using HTML forms
Week 7	Project Discussion 1
Week 8	Create Internal CSS & External CSS
Week 9	-Using different CSS color style -Define classes and id -Trying different selection ways
Week 10	Create a CSS to format tables and lists
Week 11	Using Border properties, Padding Properties, Margin property, etc.. to format the web page elements
Week 12	Project Discussion 2
Week 13	Build functions in JavaScript
Week 14	Create a dynamic HTML page
Week 15	Project Discussion 3

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Programming the World Wide Web, 7th edition, Robert W. Sebesta, 2012, Pearson Addison Wesley.	
Recommended Texts	HTML & CSS: Design and Build WebSites Paperback – 18 Nov 2011	
Websites	http://www.w3schools.com	

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



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Research Methodology		Module Delivery
Module Type	Support		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	HUC-CSIT302		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGIII	Semester of Delivery	
Administering Department	CS	College	HUC
Module Leader	Hadeel Talib Mangi	e-mail	hadeel_talib@hilla-unc.edu.iq
Module Leader's Acad. Title	Assistant Lecter.	Module Leader's Qualification	Ph.D.
Module Tutor	Hadeel Talib Mangi	e-mail	hadeel_talib@hilla-unc.edu.iq
Peer Reviewer Name	Non	e-mail	...
Scientific Committee Approval Date	16/09/2025	Version Number	V1



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

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

Module Objectives أهداف المادة الدراسية	Understand the fundamentals: Gain a solid understanding of the basic principles and concepts of research methodology, discuss and explain the data collection and analysis methods you used in your research. A key part of your project, or research paper, the methodology chapter explains what you did and how you did it, allowing readers to evaluate the reliability and validity of your research and your dissertation topic. Summarize your project's approach and purpose, objectives should appear in the research introduction, and at the end of your problem statement you have to find a suitable solution.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Educational research uses a number of terms for this concept, including learning goals, student learning objectives, session outcomes, and more, we will use learning outcomes as a general term for what students will learn and how that learning will be assessed. This includes both goals and objectives such as: Develop an understanding of the process and outputs of a literature review. Recognize the key characteristics of qualitative and quantitative research methods. Examine methods of conducting and analyzing quantitative and qualitative research. Understand what is involved in writing up and presenting research findings in an appropriate manner. Plan a coherent research project from start to finish.
Indicative Contents المحتويات الإرشادية	Project contents for the undergraduate student [35 hrs] 1- What is Research? 2- Research Types. 3- Research Proposal. 4- Project Documentation. - a- Project title. - b- Abstract. - c- Thesis chapters. - d- References 5- Project Corrections Student and Supervisor Interaction [5 hrs] Research Problem: Statement, Selection Procedure, and Techniques [10 hrs] Research Objectives [10 hrs] Literature Review [10 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	various strategies can be employed to facilitate effective learning and engagement. Here are some learning and teaching strategies commonly used, Lectures: Delivering lectures to present theoretical concepts, principles, and foundational knowledge. Interactive Discussions: Encourage students to

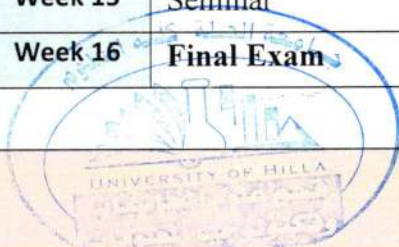
	actively participate in discussions by asking questions, sharing their thoughts, and engaging in peer-to-peer learning. Discussions can focus on challenging concepts. Assessments and Feedback: Use a variety of assessment methods such as quizzes, assignments, projects, and exams to evaluate students' understanding
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Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	15	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	55	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	70		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (20)	6 and 12	1-5 and 6-11
	Assignments	1	10% (10)	14	All
	Projects / Lab.				
	Projects / Pr.				
	Seminar	1	10% (10)	15	All
Summative assessment	Midterm Exam	2hr	10% (10)		
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Project contents for the undergraduate student
Week 2	Project Documentation: Project title, Abstract, Thesis chapters, References

Week 3	Most critical things in writing report
Week 4	Student and Supervisor Interaction
Week 5	Selecting a Research Problem (Sources of problem)
Week 6	Problem Statement, Selection Procedure, and Techniques
Week 7	Statement of the problem in a general way, Understanding the nature of the problem.. Surveying the available literature, Developing the ideas through discussions, Rephrasing the research problem into a working proposal
Week 8	Midterm Exam
Week 9	Research Objectives
Week 10	Literature Review
Week 11	Literature Search, Sources of Materials
Week 12	Choose a topic
Week 13	Summarize the literature
Week 14	Conclusion and References
Week 15	Seminar
Week 16	Final Exam

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

Week 13	
Week 14	
Week 15	

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Research Methodology: Methods and Techniques (second edition)	
Recommended Texts	Research Methodology and Scientific Writing 2nd Edition (C. George Thomas)	
Websites	https://www.scribbr.com/dissertation/methodology/ https://www.bestcolleges.com/blog/best-online-resources-academic-research/	

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	Graphical User Interface		Module Delivery
Module Type	Elective		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☒ Seminar
Module Code	HUC-CS305		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGIII	Semester of Delivery	
Administering Department	CS	College	College of science
Module Leader	Ashraf Farhan Hatem	e-mail	ashraffarhan226@hilla-unc.edu.iq
Module Leader's Acad. Title	Assist. Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Ashraf Farhan Hatem	e-mail	ashraffarhan226@hilla-unc.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	16/09/2025	Version Number	1.0

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



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1- Understand UI Principles: Develop a solid understanding of the principles and practices of User Interface design, including its importance and role in software and application development. 2- User-Centered Design: Apply user-centered design principles to create effective and engaging UIs. This involves understanding user needs, conducting user research, creating user personas and user stories, and considering information architecture and task flows. 3- Proficiency in UI Design Tools: Gain proficiency in using industry-standard UI design and prototyping tools. This includes familiarity with UI design software, prototyping tools, and collaboration and version control in UI design. 4- Design Visually Appealing UIs: Design and implement visually appealing UIs by applying visual design principles such as color theory, typography, layout, and visual hierarchy. Consideration will also be given to affordances and interactions. 5- Responsive and Adaptive UI Design: Learn how to design UIs that are responsive and adaptive to different screen sizes and resolutions. This involves using responsive layout techniques, designing adaptive UI elements, and considering media queries. 6- Evaluate and Improve UIs: Develop the ability to evaluate and critique existing UIs and propose improvements based on usability and user experience. This includes conducting usability testing, gathering user feedback, and conducting iterative design to enhance the user experience. 7- Prototyping and Implementation: Gain experience in translating UI designs into code and implementing UI components. This involves using UI development frameworks and libraries and integrating UI components with back-end systems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية 	Students will have the necessary knowledge and skills to create visually appealing, user-friendly, and responsive UIs, while considering user-centered design principles and effectively evaluating and improving UI designs based on usability and user experience. 1- Understand UI Principles: Demonstrate a solid understanding of the fundamental principles and concepts of User Interface design. 2- Apply User-Centered Design: Apply user-centered design principles to create effective and engaging UIs by considering user needs, conducting user research, and creating user personas and user stories. 3- Proficiency in UI Design Tools: Demonstrate proficiency in using industry-standard UI design and prototyping tools to create UI designs and interactive prototypes. 4- Design Visually Appealing UIs: Design visually appealing UIs by applying visual design principles such as color theory, typography, layout, and visual hierarchy. 5- Develop Responsive and Adaptive UIs: Develop UIs that are responsive and adaptive to different screen sizes and resolutions, using responsive layout techniques and designing adaptive UI elements.

	6- Evaluate and Improve UIs: Evaluate existing UIs and propose improvements based on usability and user experience, using usability testing methods, gathering user feedback, and conducting iterative design. 7- Implement UIs: Implement UI designs by translating them into code and integrating UI components with back-end systems using UI development frameworks and libraries.
Indicative Contents المحتويات الإرشادية 	The indicative contents of an GUI module have a list of common topics that are typically covered in an GUI module: 1. Introduction to User Interface Design [4 hrs] • Definition and importance of UI design • Role of UI in software and application development • Principles of effective UI design 2. User-Centered Design [4 hrs] • Understanding user needs and requirements • Conducting user research and usability testing • Creating user personas and user stories • Information architecture and task flows 3. Visual Design Principles [8 hrs] • Color theory and color schemes • Typography and font selection • Layout and composition • Visual hierarchy and affordances 4. Interaction Design [8 hrs] • Navigation design and menu systems • Input methods and controls (buttons, forms, sliders, etc.) • Feedback and animations • Microinteractions and transitions 5. UI Design Tools and Technologies [8 hrs] • Overview of UI design software (e.g., Adobe XD, Sketch, Figma) • Prototyping tools for UI design (e.g., InVision, Marvel, Proto.io) • Collaboration and version control in UI design 6. Responsive and Adaptive UI Design [6 hrs] • Designing UIs for different screen sizes and resolutions • Responsive layout techniques (e.g., grids, flexbox) • Adaptive UI elements and media queries 7. Usability Evaluation and User Experience (UX) [8 hrs] • Usability testing methods and techniques • Gathering user feedback and conducting heuristic evaluations • Iterative design and improvement based on user experience 8. Case Studies and Examples [6 hrs] • Analysis of well-designed UIs in popular applications • Examining UI design patterns and best practices • Ethical considerations in UI design (e.g., accessibility, inclusivity) 9. Prototyping and Implementation [6 hrs]

	• Translating UI designs into code • UI development frameworks and libraries (e.g., React, Angular, Flutter) • Integrating UI components with back-end systems 10. Practical UI Design Projects [6 hrs] • Hands-on exercises and projects to develop UI designs • Creating interactive and visually appealing UI prototypes • Collaborative design and development in small teams
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	To teaching an operating systems module, various strategies can be employed to facilitate effective learning and engagement. Here are some learning and teaching strategies commonly used in operating systems modules: 1. Lectures: In-class lectures can be used to introduce students to the theoretical concepts, principles, and best practices of UI design. Lectures can also include real-world examples and case studies to illustrate key concepts. 2. Practical Workshops: Hands-on workshops provide students with opportunities to apply UI design principles and techniques. These workshops can involve designing UI prototypes, conducting usability testing, and implementing UI components using relevant software and tools. 3. Group Projects: Collaborative group projects allow students to work in teams to design and develop UIs for specific applications or scenarios. This approach fosters teamwork, communication, and problem-solving skills. 4. Case Studies and Analysis: Analyzing well-designed UIs in popular applications or websites can help students understand and evaluate effective UI design principles and patterns. Students can critically analyze the UIs, identify strengths and weaknesses, and propose improvements. 5. Guest Speakers: Inviting industry professionals who specialize in UI design to share their experiences and insights can provide students with valuable real-world perspectives. Guest speakers can discuss current trends, challenges, and best practices in UI design. 6. Usability Testing: Incorporating usability testing activities allows students to gather feedback from potential users and evaluate the effectiveness and usability of their UI designs. Students can conduct usability tests, analyze the results, and make iterative design improvements. 7. Online Resources and Tutorials: Providing students with access to relevant online resources, tutorials, and documentation on UI design tools and technologies allows them to further enhance their knowledge and skills outside the classroom. 8. Critiques and Peer Reviews: Encouraging students to participate in critique sessions and peer reviews can foster a collaborative learning environment. Students can provide constructive feedback on each other's UI designs, allowing for reflection and improvement. 9. Independent Study: Assigning readings, research assignments, and independent projects related to UI design can encourage students to explore

	specific topics in-depth and develop their expertise in specific areas of UI design.
	10. Assessment Methods: Assessments can include a combination of individual and group projects, presentations, design portfolios, and written assignments. This ensures that students can demonstrate their understanding of UI principles, practical skills, and critical analysis abilities.

Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem)	65	Structured SWL (h/w)	4
الحمل الدراسي المنتظم للطلاب خلال الفصل		الحمل الدراسي المنتظم للطلاب أسبوعيا	
Unstructured SWL (h/sem)	60	Unstructured SWL (h/w)	4
الحمل الدراسي غير المنتظم للطلاب خلال الفصل		الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Total SWL (h/sem)	125		
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	5% (5)	3 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	2	10% (10)	Continuous	All
	Projects / Pr.	2	10% (10)	7 and 13	LO #5, #10 and #11
	Seminar	1	5% (5)	13	LO #1 - #11
Summative assessment	Midterm Exam	2hr	10% (10)	8	All
	Final Exam	3hr	50% (50)	17	LO #1, #2 and #10, #11
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to UI Design and its Importance.
Week 2	User-Centered Design and Understanding User Needs.
Week 3	Conducting User Research and Usability Testing.
Week 4	Creating User Personas and Information Architecture.
Week 5	Visual Design Principles and Color Theory.

Week 6	Typography and Layout Composition.
Week 7	Visual Hierarchy and Interaction Design Principles.
Week 8	Mid-term test
Week 9	Navigation Design and Input Methods.
Week 10	Buttons, Forms, and Feedback.
Week 11	UI Design Tools and prototyping Tools for UI Design.
Week 12	Collaboration in UI Design and Version Control.
Week 13	Responsive and Adaptive UI Design.
Week 14	Responsive Layout Techniques and Grid Systems.
Week 15	Adaptive UI Elements and Media Queries.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Understanding the principles of user interface design.
Week 2	Lab 2: Exploring design tools such as Adobe XD, Sketch, or Figma for UI design
Week 3	Lab 3: Creating wireframes and interactive prototypes using design tools
Week 4	Lab 4: Exploring color schemes and typography choices for effective UI design
Week 5	Lab 5: Designing layouts and utilizing grid systems for UI organization
Week 6	Lab 6: Creating visual hierarchies and structuring information in UI design
Week 7	Lab 7: Incorporating icons and illustrations to enhance UI visuals
Week 8	Lab 8: Mini project
Week 9	Lab 9: Creating responsive and user-friendly web interfaces
Week 10	Lab 10: UI Animation and Motion Design
Week 11	Lab 11: UI Testing and Usability Evaluation
Week 12	Lab 12: Designing for Accessibility and Inclusive User Experience
Week 13	Lab 13: UI Design Patterns and Best Practices
Week 14	Lab 14: Responsive Design and Adaptive Layouts
Week 15	Lab 15: Dedicated time for students to work on their own UI design projects, followed by project presentations and review

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- The Non-Designer's Design Book" by Robin Williams.	Yes
Recommended Texts	- Refactoring UI : Adam Wathan & Steve Schoger. - Practical UI : Adham Dannaway.	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 Engineering with team Project		Module Delivery
Module Type	Elective		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	HUC-CS301		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGIII	Semester of Delivery	5
Administering Department	CS	College	HUCCS
Module Leader	م.م شهد رائد هادي	e-mail	shahed.raed@hilla-unc.edu.iq
Module Leader's Acad. Title	Asst. Teacher	Module Leader's Qualification	MSc.
Module Tutor	م.م شهد رائد هادي	e-mail	shahed.raed@hilla-unc.edu.iq
Peer Reviewer Name	Non	e-mail	...
Scientific Committee Approval Date	20/06/2023	Version Number	V1

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	HUC-CS208	Semester	4
Co-requisites module	Non	Semester	...



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module aim and Objectives أهداف المادة الدراسية	1. Good understanding of software lifecycles and the basic introduction to software. 2. By building on knowledge and skills acquired in introductory courses, this module develops more sophisticated techniques for solving software development problems. 3. Additionally, the course aims to provide basic skills in software development. 4. As a bridge to more advanced study, the module's organization and difficulty level are designed to deepen students' understanding of software development. 5. In the development of general problem-solving skills and intellectual maturity, emphasis will be placed on conceptual understanding, and deriving physical meaning from mathematical expressions and visual representations. 6. By the end of the course, students will be able to handle the fundamentals of software development.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. It's important that students become familiar with the main components, models, and approaches in software development. 2. Understanding how to handle real-world problems and find suitable solutions to them by developing suitable software. 3. Make the student able to know step-by-step software engineering.
Indicative Contents المحتويات الإرشادية	Introduction to software engineering with team project (20 hrs) software engineering lifecycle (20 hrs) software engineering lifecycle (design) (20 hrs) software engineering lifecycle (implement)(20 hrs) software engineering lifecycle (test)(20 hrs) software engineering lifecycle (evolution, operation, maintenance (20 hrs)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Lectures and tutorials will be used to deliver the module. The tutorials will be used to solve problems in an interactive environment. Real examples of software can be used to describe step-by-step software development in the engineering manner of the three axes.
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A good way to learn is through oral conversation as well as through pair sharing, discussion, and presentations.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	60	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	120		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	2,5,and 10	
	Assignments	1	10% (10)	Continuous	All
	Projects / Lab.	1	10% (10)	6	
	Projects / Pr.				
	Seminar	1	10% (10)	7	
Summative assessment	Midterm Exam	2hr	10% (10)		
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to software engineering with team project
Week 2	Introduction to software engineering with team project
Week 3	software engineering lifecycle (introduction)

Week 4	software engineering lifecycle (introduction) contin..
Week 5	software engineering lifecycle (feasibility study)
Week 6	software engineering lifecycle (Gathering requirement)
Week 7	software engineering lifecycle (Software analyses)
Week 8	software engineering lifecycle (Software Design)
Week 9	software engineering lifecycle (Software Design)
Week 10	software engineering lifecycle (Software implementation)
Week 11	software engineering lifecycle (Software implementation)
Week 12	software engineering lifecycle (Software testing)
Week 13	software engineering lifecycle (Software testing)
Week 14	software engineering lifecycle (Software Evolution)
Week 15	software engineering lifecycle (Software operation)
Week 16	software engineering lifecycle (Software maintenance)

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction of software development using C# Visual Studio.net (windows application)
Week 2	Introduction of software development using C# Visual Studio.net (windows application)
Week 3	using C# language and Visual Studio .net in desktop application
Week 4	using C# language and Visual Studio .net in desktop application
Week 5	using C# language and Visual Studio .net in desktop application
Week 6	using C# language and Visual Studio .net in desktop application
Week 7	Organizing students into groups and distributing projects
Week 8	Linking theoretical topics of software engineering with the practical part
Week 9	Examining students' performance and their weekly progress on their projects
Week 10	Examining students' performance and their weekly progress on their projects
Week 11	Examining students' performance and their weekly progress on their projects
Week 12	Examining students' performance and their weekly progress on their projects
Week 13	Examining students' performance and their weekly progress on their projects
Week 14	Examining students' performance and their weekly progress on their projects
Week 15	Discuss projects for students in each group separately

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Software Engineering, Tenth Edition by Ian Sommerville	Yes
Recommended Texts	Introduction to Software Engineering By Ronald J. Leach	Yes
Websites	https://software-engineering-book.com/ https://www.wiley.com/en-us/Case+Study+Research+in+Software+Engineering%3A+Guidelines+and+Examples-p-9781118181003	

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	Language Translator		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☒ Seminar	
Module Code	HUC-CS302			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	UGIII	Semester of Delivery		5
Administering Department	CS	College	HUCCS	
Module Leader	Ali Faris Razzaq		e-mail	ali.faris@hilla-unc.edu.iq
Module Leader's Acad. Title	Assistant Lecturer		Module Leader's Qualification	M.S.c.
Module Tutor	Ali Faris Razzaq		e-mail	ali.faris@hilla-unc.edu.iq
Peer Reviewer Name	Non		e-mail	...
Scientific Committee Approval Date	20/06/2023		Version Number	V1

(Signature)

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CS203	Semester	3
Co-requisites module	Non	Semester	...



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	Teaching how the translator works in any language that is designed by knowing the algorithms for each step and applying them in practice, as well as knowing the errors that appear during implementation, whether the errors are lexical, Syntactical, Semantical or logical, and how to correct them according to the methods adopted in each algorithm.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Gain a solid understanding of the underlying concepts and principles of programming languages. 2. Develop the ability to formally specify programming languages and describe program behavior. 3. Comprehend the implementation aspects of programming languages. 4. Compare and evaluate the strengths and weaknesses of different programming paradigms. 5. Understand how programming languages interface with operating systems and hardware. 6. Acquire the skills to learn new programming languages efficiently. 7. Apply programming language principles to select the most appropriate language for specific problems. 8. Demonstrate knowledge of programming language translation and program analysis. 9. Explore the interaction of programming languages with concurrent and distributed systems. 10. Design new programming languages based on foundational principles. (Optional according to the creativity of the student)
Indicative Contents المحتويات الإرشادية	Part I: Introduction 1. Introduction 2. A Simple Syntax-Directed Translator Part II: Lexical Analysis 3. Lexical Analysis 4. Finite Automata and Lexical Analysis 5. Regular Expressions and Lexical Specifications Part III: Syntax Analysis 6. Syntax Analysis 7. Top-Down Parsing 8. Bottom-Up Parsing 9. LR Parsing 10. Efficient Parsing Part IV: Semantic Analysis 11. Semantic Analysis 12. Syntax-Directed Translation 13. Type Checking 14. Intermediate-Code Generation 15. Code Optimization 16. Code Generation 17. Machine-Independent Optimizations Part V: Code Generation 18. Introduction to Code Generation 19. Basic Code Generation Techniques 20. Instruction Selection 21. Register Allocation 22. Local Code Optimization 23. Global Code Optimization

	24. Machine-Specific Optimizations Part VI: Advanced Topics 25. Interprocedural Analysis 26. Code Generation for Object-Oriented Languages 27. Code Generation for Modern Processors 28. Code Optimization for Modern Processors Part VII: Code-Related Tools 29. Linking and Loading
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Lectures: Instructor presents concepts, principles, and details. Transmits foundational knowledge. 2- Practical Exercises: Students apply language concepts through coding, problem-solving. 3- Case Studies: Real-world examples connect theory to practice. 4- Group Discussions: Collaborative learning, problem-solving, idea exchange. 5- Hands-on Projects: Develop programs, reinforce skills, understand paradigms. 6- Research and Exploration: Independent learning, deeper understanding. 7- Assessments: Quizzes, exams, assignments evaluate comprehension. 8- Guest Lectures or Industry Speakers: Real-world insights, industry perspectives. 9- Online Resources and Tools: Interactive tutorials, practice opportunities. 10- Feedback and Reflection: Timely feedback, improvement identification. Note: Strategies may vary based on institution, instructor, resources.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	60	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	120		

Module Evaluation تقييم المادة الدراسية				
	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Quizzes	3	03%	4+11+14	

Formative assessment	Assignments	3	03%	10+12+15	
	Projects / Lab.	10	20%	from 2 to 11	
	Projects / Pr.	1	10%	14+15	
	Seminar	1	4%	13+14	
Summative assessment	Midterm Exam	2hr	10% (10)		
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Compiler and Compiler phases
Week 2	Lexical Analyzer
Week 3	Concept of Syntax Analyzing phase +Syntax Phase: grammar, parse tree, derivation,
Week 4	Top-Down parsing: left recursion, left factoring,
Week 5	Ambiguity and the ways to eliminate it
Week 6	Top-Down Parsing technique LL(1)
Week 7	Midterm Exam
Week 8	Bottom-Up Parsing
Week 9	operator precedence parser
Week 10	LR Parser (SLR Parser)
Week 11	Symbol Table
Week 12	Semantic Analysis
Week 13	Intermediate Code Generation
Week 14	Control Flow +Code Generation
Week 15	Seminar discussion
Week 16	Code Optimization

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introducing Python Basics (input, output and loop functions) +String handling in Python with introducing string functions



Week 2	Learn the basics of how to construct a RE + Several tasks for Regular Expressions
Week 3	Learning how programming Languages Ignore redundant spaces, tabs and newlines. It should also ignore comments.
Week 4	1- Recognize identifier RE.+ 2- Recognize number (int, double) RE
Week 5	Recognize keywords + Special Characters
Week 6	Write program that read a text file and print out the tokens
Week 7	Learn How to build Comparison Pattern Like in C++ Programming Language
Week 8	Build if statement pattern Like in C++ Programming Language
Week 9	Build nested if statement pattern Like in C++ Programming Language
Week 10	Build for statement pattern Like in C++ Programming Language
Week 11	Build while statement pattern Like in C++ Programming Language
Week 12	Build nested While statement pattern in C++ Programming Language
Week 13	Symbol Table
Week 14	Mini Project discussion and presentation for top-down and bottom up technique
Week 15	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Compilers Principles, Techniques, and Tools, 2nd Ed	yes
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

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



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Machine Learning		Module Delivery	
Module Type	Elective		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	HUC-CS303			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	UGIII	Semester of Delivery		5
Administering Department	CS	College	HUCCS	
Module Leader	Zainab Hussein Ali		e-mail	Zynb4748@gmail.com
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	Ph.D.
Module Tutor	Zainab Hussein Ali		e-mail	Zynb4748@gmail.com
Peer Reviewer Name	Non		e-mail	...
Scientific Committee Approval Date	20/06/2023		Version Number	V1

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CS205	Semester	4
Co-requisites module	Non	Semester	...



Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To provides a broad introduction to a variety of topics in artificial Intelligence, Machine Learning, and Heuristic methods. 2. To develop problem-solving skills and a basic understanding of soft computing, and machine learning algorithms. 3. Student empowerment by applying machine learning concepts, algorithms, and soft computing methods in local and global labor markets. 4. Monitor, evaluate, and test machine learning algorithms with various conditions and the environment. 5. Gather data and analyze machine learning requirements. 6. Identify, analyze, and evaluate infrastructure power machine requirements regarding machine learning algorithms. By the end of the module, students should have a solid foundation in soft computing, machine learning, and heuristic algorithms enabling them to apply their knowledge and make informed decisions to develop intelligent applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	machine learning outcomes refer to the desired results or objectives in the field of artificial intelligence. These outcomes aim to develop intelligent applications that can serve various areas of human requirements. Here are some common machine-learning outcomes: 1. Understand the concept of learning in computer and science. 2. Understand the difference between supervised and unsupervised learning. 3. understand the basic concepts of soft computing 4. Understand a wide variety of learning algorithms. 5. Apply the algorithms to a real problem, optimize the models 6. Understand how to evaluate models generated from data 7. learned, and report on the expected accuracy that can be achieved by applying the models.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: <u>Part – A data types and preprocessing</u> [20 hrs.] introduction to data types (structured, unstructured, semi-structured). introduction to data processing (data gathering, data cleaning, data integration, and data mining) <u>Part – B Machine learning principles</u> [20 hrs.] An introduction to learning methods (supervised, unsupervised, semi-supervised, reinforcement learning). <u>Part – C Supervised Forecast Models</u> [35 hrs.] Regression models (Linear regression model, Gradient Descent Algorithm, Learning rate α, data normalization) Classification models (types of classifiers, K – Nearest Numbers, Examples) Decision Tree Algorithm, Example. naïve Bayes theorem (Bayes' Theorem, Laplace Correction, Types of Bayes Classifier, Document classification by Naive Bayes, Performance Measures)

	<u>Part – D Unsupervised Models [15 hrs.].</u> <u>Clustering algorithms</u> (Hierarchical Clustering Algorithm, K – Means algorithm) <u>Part – E Soft Computing [55 hrs.].</u> Components of soft computing Neural Networks (NN) Support Vector Machine (SVM) Fuzzy Logics (FL) Evolutionary Computing (Genetic algorithms, Differential evolution) Metaheuristics Models Swarm Intelligence Ant Colony Gray wolf optimization Particle Swarm Optimization Non – Swarm Intelligence based algorithms Cuckoo Search algorithm
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Throughout the module, it is important to employ effective learning and teaching strategies to ensure students grasp the concepts and develop the necessary skills. The main strategy that will be adopted in delivering this module: 1. Giving lectures. 2. Practical Exercises within the laboratories: Provide students with opportunities to practice their skills through practical exercises. 3. Conducting theoretical exams. 4. Request a report from students to teach them how to do research on a specific topic. Request some small projects from student groups of real-world examples and case studies to demonstrate the relevance and impact of computing security.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	85	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	145		



Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	CL: 2,3 and 9,10
	Assignments	2	5% (5)	2 and 12	CL: 6 and 11
	Projects / Lab.	1	10% (10)	Continuous	All
	Projects / Pr.	2	10% (10)	6 and 15	CL: 3,5 and 12, 13
	Seminar	1	5% (5)	14	CL: 7, 11, 13
Summative assessment	Midterm Exam	2hr	10% (10)	8	CL: 1 - 7
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to data types (structured, unstructured, semi-structured)
Week 2	introduction to data processing (data gathering, data cleaning, data integration, and data mining)
Week 3	An introduction to learning models (supervised, unsupervised, semi-supervised, reinforcement).
Week 4	Regression models (Linear regression model, Gradient Descent Algorithm, Learning rate α)
Week 5	Classification models (types of classifiers, K – Nearest Numbers, Examples)
Week 6	Decision Tree Algorithm, Example
Week 7	Naïve Bayes theorem
Week 8	Midterm Exam
Week 9	Unsupervised models (Hierarchical Clustering Algorithm, K – Means algorithm)
Week 10	Components of soft computing (Genetic algorithms)
Week 11	Ant Colony Optimization
Week 12	Neural Networks
Week 13	Neural Networks (practical examples)
Week 14	Fuzzy Logics
Week 15	Seminar Discussion
Week 16	The preparatory week before the Final Exam



Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Definition of Datasets (Kaggle, GitHub), ML libraries (Pandas, Numpy, SK-Learn)
Week 2	Lab 2: Dataset Processing with Pandas (missing values, data cleaning, integration, etc.,)
Week 3	Lab 3: Data Visualization (Matplotlib library)
Week 4	Lab 4: Linear Regression and Gradient descent algorithm
Week 5	Lab 5: Classification methods; K – Nearest Number
Week 6	Lab 6: Naïve Bayes method
Week 7	Lab 7: Naïve Bayes method
Week 8	Lab 8: Practical Discussion-1 (small project)
Week 9	Lab 9: Hierarchical Clustering algorithm, K- Means Clustering algorithm
Week 10	Lab 10: Genetic algorithm
Week 11	Lab 11: Ant Colony
Week 12	Lab 12: Defining Neural Networks Functions
Week 13	Lab 13: Neural Networks with practical examples
Week 14	Lab 14: Fuzzy Logic
Week 15	Lab 15: Practical Discussion-2 (small project)

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- zurada-introduction-to-artificial-neural-systems 1992 - Mining of massive dataset - Learning Python, 5th Edition - how to think - Machine Learning For Dummies	Yes Yes Yes Yes Yes
Recommended Texts	Python Machine Learning Cookbook Practical Solutions from Preprocessing to Deep Learning (Chris Albon)	Yes
Websites	https://www.datacamp.com/ https://www.kaggle.com/ https://scikit-learn.org/	



Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work is required but credit awarded
	F – Fail	راسب	(0-44)	A 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	Web Applications		Module Delivery	
Module Type	Elective		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	HUC-CS308			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	UGIII	Semester of Delivery		6
Administering Department	CS	College	HUC	
Module Leader	Ayat Nadhum Kadhum		e-mail	ayat.nad hum @ hilla-unc.ed u.iq
Module Leader's Acad. Title	Assistant Lecturer		Module Leader's Qualification	M.S.c.
Module Tutor	Ayat Nadhum Kadhum		e-mail	ayat.nad hum @ hilla-unc.ed u.iq
Peer Reviewer Name	Non		e-mail	...
Scientific Committee Approval Date	16/09/2025		Version Number	V1



Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CS304	Semester	5
Co-requisites module	Non	Semester	...

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	The course focuses on designing and developing Web-based applications using a variety of programming languages and tools. Students will be exposed to Internet application development architecture. Class projects include developing Web-based applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Comprehend Web Application infrastructure. 2. Apply the procedures and processes necessary for the construction of high-quality web applications. 3. Apply client/server communication techniques such as server, application, session variables, cookies, and server behaviors. 4. Determine the needs for web database and connectivity. 5. Evaluate several alternatives in the design of a web application. 6. Learn PHP language and connecting with MySQL Database
Indicative Contents المحتويات الإرشادية	-Introduction and Web Application Architecture. [10] -Web Application Programming Language and Technologies. [14] -Web Application Development Process [30] -Web Application Frameworks. [6] -PHP Basics. [20] -PHP Advanced Topics. [30] -XML language. [10]



Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	Throughout the module, it is important to employ effective learning and teaching strategies to ensure students grasp the concepts and develop the necessary skills. The main strategy that will be adopted in delivering this module: 1. Giving lectures. 2. Practical Exercises within the laboratories: Provide students with opportunities to practice their skills through practical exercises. 3. Conducting theoretical exams. 4. Request a report from students to teach them how to do research on a specific topic. 5. Request projects from student groups of real-world examples.

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem)	60	Structured SWL (h/w)	4

الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	60	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	120		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 11	
	Assignments	2	5% (5)	2 and 12	
	Projects / Lab.	1	10% (10)	Continuous	All
	Projects / Pr.	2	10% (10)	15	All
	Seminar	1	5%(5)	15	All
Summative assessment	Midterm Exam	2hr	10% (10)		
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		



Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction: Internet and Web Protocols, Web Application definition, Web Application Developers.
Week 2	Web Application Architecture.
Week 3	Web Application Programming Language: HTML and PHP.
Week 4	Web Application Programming Language: XML and JSON.
Week 5	Web Application Technologies.
Week 6	Web Application Development Process :Web Application Requirements
Week 7	Web Application Development Process :Web Application Design1
Week 8	Web Application Development Process :Web Application Design2
Week 9	Mid term Exam
Week 10	Web Application Development Process :Implementation.
Week 11	Web Application Development Process :Deployment and Installation.

Week 12	Web Application Development Process : Maintenance and Evolution
Week 13	Testing Web Applications.
Week 14	Web Application Frameworks.
Week 15	Seminer
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to PHP:Basic Syntax, Defining variable and constant, Php Data type, Operator and Expression
Week 2	PHP Decisions and loops.
Week 3	PHP Function.
Week 4	PHP Array.
Week 5	PHP String: String Searching & Replacing String, Formatting String, String Related Library function
Week 6	Embedding PHP Into HTML and Embedding HTML Into PHP.
Week 7	Handling Html Form with PHP.
Week 8	PHP Working with files and Directories.
Week 9	PHP Session.
Week 10	Cookie.
Week 11	Database Connectivity with MySql(Select,Insert).
Week 12	Database Connectivity with MySql(Delete, Update).
Week 13	PHP Exception Handling.
Week 14	PHP and XML.
Week 15	Project Discussion



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

Required Texts	-Web Applications Engineering by Casteleyn , Peter Dolog, Matera -Learning PHP, MySQL, books by ' O' riley Press	
Recommended Texts	- Web Developer's Reference Guide by Johanan, Khan, Zea, 2016	
Websites	https://www.w3schools. https://php.org	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
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	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 Development Frameworks		Module Delivery
Module Type	Elective		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☒ Seminar
Module Code	HUC-CS310		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGIII	Semester of Delivery	
Administering Department	CS	College	HUC
Module Leader	Hadeel Talib Mangi	e-mail	hadeel_talib@hilla-unc.edu.iq
Module Leader's Acad. Title	Assist Lecter	Module Leader's Qualification	Ph.D.
Module Tutor	Hadeel Talib Mangi	e-mail	hadeel_talib@hilla-unc.edu.iq
Peer Reviewer Name	Non	e-mail	...
Scientific Committee Approval Date	16/09/2025	Version Number	V1



Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Non	Semester	...
Co-requisites module	Non	Semester	...

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives

أهداف المادة الدراسية

1. A framework help bridge the gap between software programming education and labor market needs.
2. Establish a corporate-style interaction between the instructor, managers, software project teams, and customers. All stakeholders are responsible for delivering a satisfactorily completed project with sufficient complexity and depth.
3. To develop team work skills and understand the role of each member in building practical software.
4. Work on an integrated project from start to finish, including programming, appropriate data structures using modern methods and tools.
5. Design, code, test, and debug a modest-sized software that uses language provided libraries and frameworks (including for getting data from the web through APIs).
6. By the end of the module, students should have a basic foundation in many software development frameworks, enabling them to apply their knowledge to Engage in the labor market.

The learning outcomes for a module on software development frameworks typically aim to bring together fundamental concepts and skills related to software development, focusing on concepts and skills that should students be mastered early in a computer science program, This includes fundamental programming concepts and good programming practices for writing good quality software. Here are some common learning outcomes for a software development frameworks module:

1. Efficiency and Productivity: Frameworks provide a structured approach to software development, offering pre-built components, libraries, and tools that streamline the development process. By leveraging these resources, developers can work more efficiently, reducing development time and effort.
2. Code Reusability: Frameworks promote the concept of code reusability, allowing developers to build upon existing components and modules. This reduces redundancy and helps create more maintainable and scalable codebases. Developers can focus on implementing specific business logic rather than reinventing the wheel for common functionalities.
3. Consistency and Standardization: Frameworks often enforce coding conventions, design patterns, and best practices. This leads to more consistent and standardized code across the development team, improving collaboration, code readability, and maintainability.
4. Security: Many frameworks incorporate security features and practices by default. They may offer built-in mechanisms for handling input validation, authentication, authorization, and protection against common vulnerabilities. By utilizing a well-established framework, developers can benefit from these security measures without having to develop them from scratch.
5. Community and Support: Popular software development frameworks often have vibrant communities surrounding them. These communities provide valuable resources such as documentation, forums, tutorials, and code

Module Learning Outcomes

مخرجات التعلم للمادة الدراسية



	samples. Developers can seek help, share knowledge, and contribute to the framework's ecosystem, creating a supportive environment. 6. Scalability and Flexibility: Frameworks are designed to support the development of scalable applications. They provide architectural patterns, database integration, and performance optimization techniques that enable applications to handle increased user loads and data volumes. Frameworks also offer flexibility, allowing developers to customize and extend their functionalities based on specific project requirements. 7. Industry Relevance and Employability: Proficiency in popular software development frameworks is highly sought after by employers. Acquiring knowledge and experience in these frameworks can enhance a developer's job prospects and increase their employability in the software development industry. 8. Future-Proofing: Studying software development frameworks exposes developers to modern practices and technologies. Frameworks often evolve to incorporate the latest advancements in the software development landscape. By staying up to date with frameworks, developers can future-proof their skills and adapt to changing industry trends.
Indicative Contents المحتويات الإرشادية 	The indicative contents of a software development frameworks module have a list of common topics that are typically covered in a software development frameworks module: 1. Introduction to Software Development Frameworks [6 hrs] ● Definition and purpose of frameworks in software development ● Benefits of using frameworks ● Types of frameworks (e.g., front-end, back-end, full-stack) 2. Front-end Development Frameworks [6 hrs] ● Overview of popular front-end frameworks (e.g., React, Angular, Vue.js) ● Building user interfaces and components with front-end frameworks ● Handling state management and data binding 3. Back-end Development Frameworks [6 hrs] ● Introduction to popular back-end frameworks (e.g., Node.js/Express, Ruby on Rails, Django) ● Developing APIs and server-side applications using back-end frameworks ● Integrating databases and performing CRUD operations 4. Full-Stack Development Frameworks [8 hrs] ● Overview of full-stack frameworks ● Integrating front-end and back-end components in a full-stack application

	● Implementing data flow and communication between different layers
	5. Database Integration with Frameworks [6 hrs] ● Connecting databases to frameworks (e.g., MongoDB with Mongoose, MySQL) ● Working with database models and performing database operations
	6. Testing in Frameworks [6 hrs] ● Overview of testing frameworks and tools for automated testing (e.g., Jest, Mocha, Jasmine) ● Writing unit tests and performing integration testing for framework-based applications
	7. Deployment and Hosting with Frameworks [4 hrs] ● Deploying applications to production environments using framework-specific deployment methods (e.g., Heroku, AWS, Azure) ● Managing application configurations and environment variables
	8. Security Best Practices in Frameworks [4 hrs] ● Common security vulnerabilities in web applications and techniques to mitigate them within frameworks ● Implementing secure coding practices and protecting against common attacks
	9. Framework Documentation and Community Resources [2 hrs] ● Exploring official documentation, community forums, and resources for learning and troubleshooting frameworks ● Leveraging community support and best practices
	10. Cross-platform development Framework Introduction [16 hrs] ● Applying the learned concepts and skills to develop real-world applications using chosen frameworks ● Project planning, implementation, and presentation



Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	To teaching a software development frameworks module, various strategies can be employed to facilitate effective learning and engagement. Here are some learning and teaching strategies commonly used in software development frameworks modules 1. Lectures: Delivering lectures to present foundational knowledge of programming language and frameworks. Lectures can include visual aids, examples, and demonstrations to enhance understanding.

	- Interactive Discussions: Encourage students to actively participate in discussions by asking questions, sharing their thoughts, and engaging in peer-to-peer learn - Hands-on Lab Sessions: Conduct practical lab sessions where students can gain hands-on experience with framework tools, commands, and programming exercises. These sessions provide an opportunity to reinforce theoretical concepts and develop practical skills. - Group Projects: Assign group projects that involve designing, implementing, complete software. Group projects promote teamwork, problem-solving, and build practical application - Online Resources and Tutorials: Provide access to online resources, tutorials, and interactive learning materials related to frameworks, this allows students to explore additional content, reinforce their understanding, and self-assess their progress. - Use a common method of sharing the project between groups of students and work together to build a project - Assessments and Feedback: Use a variety of assessment methods such as quizzes, assignments, projects, and exams to evaluate students understanding. Provide timely and constructive feedback to help students improve their knowledge and skills.
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Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	65	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	60	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4
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	5% (10)	5 and 10	CL: 2,3 and 9,10
	Assignments	2	5% (5)	2 and 12	CL: 6 and 11
	Projects / Lab.	1	15% (15)	Continuous	All
	Projects / Pr.	1	10% (10)	6 and 15	CL: 3,5 and 12, 13

	Seminar	1	5% (5)	14	CL: 7, 11, 13
Summative assessment	Midterm Exam	2hr	10% (10)	8	CL: 1 - 7
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Software Development Frameworks - overview and importance
Week 2	Front-end Development Frameworks
Week 3	Back-end Development Frameworks - Node.js/Express, Ruby on Rails, Django.
Week 4	Full-Stack Development Frameworks
Week 5	Database Integration - connecting databases to frameworks (e.g., MongoDB, MySQL).
Week 6	Testing in Frameworks - automated testing frameworks (e.g., Jest, Mocha, Jasmine).
Week 7	Deployment and Hosting - deploying applications using cloud hosting platforms (e.g., Heroku, AWS).
Week 8	Mid-term test
Week 9	Security Best Practices in Frameworks - mitigating common security vulnerabilities.
Week 10	Framework Documentation and Community Resources - exploring official documentation and community forums.
Week 11	Mobile Framework Introduction - Overview and benefits of using Flutter for cross-platform development.
Week 12	UI Design - Building user interfaces with Flutter widgets and layouts.
Week 13	State Management - Managing state and data in Flutter applications using state management techniques.
Week 14	Integration and APIs - Integrating third-party libraries and APIs into Flutter projects.
Week 15	Project Presentations and Review - students present their projects developed using frameworks.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to Software Development Frameworks and setup the IDE
Week 2	Building a basic front-end application using the chosen framework

Week 3	Creating a RESTful API using the chosen framework
Week 4	Integrating the front-end and back-end components using the chosen framework
Week 5	Connecting a database and performing CRUD operations using the chosen framework
Week 6	Writing unit tests and performing test-driven development with the chosen framework
Week 7	Deploying the application to a cloud hosting platform (e.g., Heroku, AWS)
Week 8	Analyzing and improving the performance of a framework-based application
Week 9	Implementing security measures and addressing common vulnerabilities in a framework-based application
Week 10	Exploring official documentation, community forums, and resources for learning and troubleshooting
Week 11	Getting started with Flutter, exploring the basics of Flutter development
Week 12	Building user interfaces with Flutter widgets and layouts
Week 13	Managing state and data in Flutter applications using state management techniques
Week 14	Integrating third-party libraries and APIs into Flutter projects
Week 15	Project Presentations and Review



Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	● Practical Flutter: Improve your Mobile Development with Google's Latest Open-Source SDK" by Frank Zammetti ● Angular Development with TypeScript" by Yakov Fain and Anton Moiseev	Yes
Recommended Texts	• Clean Code: A Handbook of Agile Software Craftsmanship" by Robert C. Martin • Design Patterns: Elements of Reusable Object-Oriented Software" by Erich Gamma, Richard Helm, Ralph Johnson, and John Vlissides	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	Computer Architecture		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	HUC-CS309		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGIII	Semester of Delivery	
Administering Department	CS	College	HUCCS
Module Leader	Dina Ihsan Adnan	e-mail	dina.ehsan@hilla-unc.edu.iq
Module Leader's Acad. Title	Asst. Teacher	Module Leader's Qualification	M.S.c.
Module Tutor	Dina Ihsan Adnan	e-mail	dina.ehsan@hilla-unc.edu.iq
Peer Reviewer Name	Non	e-mail	...
Scientific Committee Approval Date	17 / 12/2025	Version Number	V1

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	HUC-CSIT202	Semester	4
Co-requisites module	Non	Semester	...

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية



Module Objectives أهداف المادة الدراسية	This course aims to make the students able to understand the computer architecture which is a software and an engineering discipline that is concerned with all aspects of software production. It is a systematic and organized approach to work of computer engineers and use appropriate tools and techniques depending on the problem to be solved, the development constraints and the resources available. computer architecture is concerned with the practicalities of developing and delivering useful software Keep pace with the rapid development in building computer systems. here some of most important topics: Introduction to computer architecture, memory addressing methods and formats, in addition to how the system deals with Computer with instructions written in computer programming language. In addition to studying processor programming A personal computer and processors designed for the purpose of running on specific devices. Giving a general overview of how to organize inputs and outputs and the process of analyzing data between computer parts and third party programming
Module Learning Outcomes مخرجات التعلم للمادة الدراسية 	1. Knowledge and understanding - Acquisition of what has been clarified from the prescribed vocabulary. - Ensure that the student is able to understand the details of computer architecture, especially the architecture of computer processors. - Linking the vocabulary that has been studied and discussed through graduation research. -Full knowledge of the processor architecture in the computer and how it relates to the rest of the computer components. - - Full knowledge of the types of memory in the computer and comparison between them, depending on several Standards. -Complete understanding of the instructions used with the processor and the types of addressing that can be used with instructions from to access the data. -Full understanding of programming using assembly language and writing microprograms 2. Subject-specific skills -The ability to deal with the computer and processor accurately and from low levels. - The ability to access the contents of all types of memory used in the computer. -The ability to write microprograms in assembly language -summer training. -Graduate research. -Scientific reports.
Indicative Contents المحتويات الإرشادية	part (A) : Processor and its architecture [60 hr] - processor architecture and structure [10 hr] - instruction types [10 hr] - instruction sequences [10 hr] - register sets [10 hr] - addressing mode [10 hr]

	- structure of machine level program [10 hr] part (B): I/O fundamentals [40 hr] -buses, protocols [20 hr] -modern buses [10 hr] -interrupt mechanism [10 hr] part (C): memory architecture [45 hr] - memory architecture and hierarchy [20 hr] - cache memory and cache coherency [15 hr] - instruction pipeline [10 hr]
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Throughout the module, it is important to employ effective learning and teaching strategies to ensure students grasp the concepts and develop the necessary skills. The main strategy that will be adopted in delivering this module: 1. Giving lectures. 2. Practical Exercises: Provide students with opportunities to practice their skills through practical exercises as a basic concept implementation 3. Conducting theoretical exams. 4. Request a report from students to teach them how to do research on a specific topic. 5. Request some small projects from student groups of real-world examples and case studies to demonstrate the relevance and impact of computation theory.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	30	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	115	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	8
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	145		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	15% (15)	5, 10, and 12	CL: 2,3 and 9,10 and 12
	Assignments	2	10% (10)	2 and 12	CL: 6 and 11
	Projects / Pr.	2	10% (10)	6 and 9	CL: 2,3 ,4 and 8
	Seminar	1	5% (5)	15	CL: 3,4,5,6,10 and 14
Summative assessment	Midterm Exam	2hr	10% (10)	6	CL:1 - 5
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	introduction to instruction set architecture
Week 2	processor architecture
Week 3	instruction types
Week 4	register set and addressing mode
Week 5	processor structure
Week 6	mid term exam
Week 7	memory- to- register and load/store architecture
Week 8	instruction sequences and flow of control
Week 9	subroutine call and return mechanism
Week 10	structure of machine level programs
Week 11	I/O fundamentals and direct access memory (DMA)
Week 12	memory architecture, latency and throughput
Week 13	cache memory, operating principles and replacement policies
Week 14	instruction pipeline
Week 15	processore and system performance
Week 16	Preparatory week before the final Exam



Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1. Computer Organization and Architecture Designing for Performance, 10th Edition, by William Stallings, 2015 2. 2- Microcomputer for engineering & scientist, G.A. Gibson, 4th edition, 1980.	yes
Recommended Texts	3. 1- Computer Organization, V. Carl et al. 5th edition, 2001.	yes
Websites		

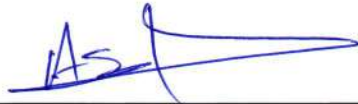
Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	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 Graphics		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CS306			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	UGIII	Semester of Delivery		6
Administering Department	Cs	College	HUCCS	
Module Leader	Asam Hamed Abbas Almohamed		e-mail	Asam.h@uokerbala.edu.iq
Module Leader's Acad. Title	Teacher		Module Leader's Qualification	Ph.D.
Module Tutor	Asam Hamed Abbas Almohamed		e-mail	Asam.h@uokerbala.edu.iq
Peer Reviewer Name	Non		e-mail	...
Scientific Committee Approval Date	17/12/2025		Version Number	V1



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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	This course introduces the fundamental concepts and techniques of computer graphics. Topics include raster graphics, vector graphics, 2D and 3D transformations, rendering algorithms, shading models, lighting models, texture mapping, and animation. Students will learn how to use industry-standard software tools to create and manipulate digital images.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the basic principles of computer graphics. 2. Develop skills in programming with Python for computer graphics applications. 3. Learn how to create 2D and 3D graphics using various techniques. 4. Understand the concepts of rendering, shading, lighting, texture mapping and animation. 5. Understand the basic principles of game design 6. Understand the principles of GUI design 7. Develop user-friendly interfaces using various components 8. Implement event-driven programming
Indicative Contents المحتويات الإرشادية	1. 2D Graphics: Drawing, Transformations, Clipping, and Filling (20 hrs) 2. 3D Graphics: Modeling, Rendering, Shading, and Lighting (20 hrs) 3. Animation Techniques: Keyframe Animation, Motion Capture, and Particle Systems (20 hrs) 4. Virtual Reality: Concepts, Technologies, and Applications (20 hrs) 5. Understand the principles of GUI design (20 hrs) 6. Develop user-friendly interfaces using various components (10 hrs) 7. Implement event-driven programming (10 hrs)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• The conversational method • Exams and quizzes. • exercises and assignments • weekly oral tests

Student Workload (SWL) الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	60	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4

Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	120
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Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (6)	5,11	
	Assignments	2	10% (10)	6,13	
	Projects / Lab.	1	15% (15)	Continuous	All
	Projects / Pr.	2	10% (10)	6,15	
	Seminar	-	-	-	
Summative assessment	Midterm Exam	2hr	10% (10)		
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Computer Graphics - Overview of computer graphics - History of computer graphics, Graphics Hardware - Applications of computer graphics
Week 2	Raster Graphics and Vector Graphics - Pixel-based images, Color models, Image file formats - Vector-based images, Geometric primitives, Coordinate systems
Week 3	2D Transformations - Translation, rotation, scaling, reflection, and shearing.
Week 4	2D Transformations - Matrix operations -composite matrices
Week 5	3D Transformations - Perspective projection, Viewing transformations - Advanced Transformations (Rotation, Scaling, etc.)



Week 6	Advanced 3D Graphics - Handling and manipulating transformable objects. - Interaction with 3D models, lighting, and shading
Week 7	Texture Mapping - Texture mapping concepts - Texture mapping techniques
Week 8	Animation Basics - Animation concepts and techniques - Keyframe animation - Skeletal animation
Week 9	Mid
Week 10	Game design and programming - Game Engines and Interactions
Week 11	Augmented Reality and Virtual Reality - Augmented Reality and Virtual Reality Basics - Creating and Displaying VR and AR Assets
Week 12	Advanced Topics in Computer Graphics - GPU programming - Machine learning in computer graphics - Real-time rendering
Week 13	Introduction to GUI Design Principles - Overview of GUI design principles - Understanding user needs and requirements - Designing effective interfaces
Week 14	User Interface Components - Introduction to various UI components (buttons, labels, text fields etc.) - Creating custom components - Handling events in UI components
Week 15	Event-driven Programming - Understanding event-driven programming - Handling events in Java Swing - Creating custom events
Week 16	

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
Week	Material Covered



Week 1	Introduction to Python Graphics Libraries - Understanding the basics of Python graphics libraries - Learning to install and configure libraries (Matplotlib, Pygame, etc.) - Introduction to 2D and 3D graphics.
Week 2	2D Graphics in Python - Working with 2D graphs - Creating line graphs, bar graphs, histograms, and pie charts. - Image filtering and analysis.
Week 3	3D Graphics in Python - 3D graphics in Python using Matplotlib - Wireframes, polyhedra, and meshes.
Week 4	Data Visualization in Python - Data Visualization basics using Matplotlib and Seaborn - Line charts, scatter plots, heat maps, and statistical charts. - Word cloud visualization
Week 5	Python Graphics Libraries - Pygame , PyOpenGL - Creating 2D graphics using Pygame - Creating 3D graphics using PyOpenGL
Week 6	- Working with Pygame libraries and understanding its functionality - Creating basic 2D games
Week 7	Assignment1 creating 2d game
Week 8	Assignment 1
Week 9	Advanced 3D Graphics in Python 1 - Creating advanced 3D models using Python - Converting 2D to 3D using Python libraries
Week 10	Advanced 3D Graphics in Python 2 - Creating advanced 3D models using Python - Converting 2D to 3D using Python libraries
Week 11	Animation in Python - Creating simple animations - Using libraries to control animation flow and create movement



Week 12	Mid
Week 13	Implementing geometric transformations using Python1.
Week 14	Implementing geometric transformations using Python2.
Week 15	assignment 2

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Foundations of Computer Science: C Edition, Second Edition by Behrouz A. Forouzan -computer Graphics with Python: A Complete Introduction to Modern 2D Graphics Programming by Danyel Fisher and Paul Molitor - "Python Graphics for Games 2D" by Harrison Kinsley - "Python Graphics for Games 3D" by Harrison Kinsley	
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	Artificial Intelligence Applications		Module Delivery	
Module Type	Elective		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	HUC-CS307			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	UGIII	Semester of Delivery		6
Administering Department	CS	College	HUCCS	
Module Leader	Ali Faris Razzaq		e-mail	ali.faris@hilla-unc.edu.iq
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	M.S.c.
Module Tutor	Ali Faris Razzaq		e-mail	ali.faris@hilla-unc.edu.iq
Peer Reviewer Name	Non		e-mail	...
Scientific Committee Approval Date	17/12/2025		Version Number	V1

Ali Faris

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CS303	Semester	5
Co-requisites module	Non	Semester	...



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	The AI Applications course aims to provide students with a strong foundation in artificial intelligence concepts, algorithms, and practical implementation. It aims to develop students' skills in applying AI techniques to solve real-world problems across domains such as Game theory, healthcare, finance, marketing, and robotics.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Ability to apply artificial intelligence techniques in various domains, including natural language processing, robotics, and game theory. 2. Knowledge of natural language processing techniques and speech and image recognition using AI. 3. Understanding AI applications in fields such as healthcare, finance, and marketing. 4. Familiarity with game theory concepts and the use of AI techniques for game analysis and strategic decision-making. 5. Capacity to evaluate and optimize the performance of AI systems. 6. Awareness of the ethical implications and challenges associated with AI applications and the ability to address them responsibly. 7. Effective communication and collaboration skills within multidisciplinary teams. 8. Keeping up with the latest developments in AI applications and assessing their impact across various industries.
Indicative Contents المحتويات الإرشادية	1. Concepts and various techniques of Artificial Intelligence[15]. 2. Artificial Intelligence applications in Natural Language Processing, such as sentiment analysis[30]. 3. Artificial Intelligence applications in Computer Vision, such as Image segmentation algorithms and medical image recognition[30]. 4. Artificial Intelligence applications in Robotics, such as robotics perception, planning and control[25]. 5. Artificial Intelligence applications in Game Theory, using it for decision-making and strategic improvement[25]. 6. Practical projects and applications in multiple domains using Artificial Intelligence techniques such as fraud detection [20]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The AI Applications course incorporates a variety of learning and teaching strategies to enhance student understanding and engagement. These strategies may include a combination of lectures, interactive discussions, hands-on coding exercises, case studies, and project work. Lectures provide theoretical knowledge and an overview of AI concepts, while interactive discussions foster critical thinking and encourage students to analyze real-world AI applications. Hands-on coding exercises allow students to gain practical experience in implementing AI models and systems. Case studies provide real-life examples that illustrate the application of AI techniques in different domains. Project work enables students to apply their knowledge and skills to solve complex AI problems, fostering creativity and teamwork. Overall, these strategies promote active learning, practical application, and a deeper understanding of AI applications. 

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	85	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	145		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	CL: 2,3 and 9,10
	Assignments	2	5% (5)	2 and 12	CL: 6 and 11
	Projects / Lab.	1	10% (10)	Continuous	All
	Projects / Pr.	2	10% (10)	6 and 15	CL: 3,5 and 12, 13
	Seminar	1	5% (5)	14	CL: 7, 11, 13
Summative assessment	Midterm Exam	2hr	10% (10)	9	CL: 1 - 8
	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المناهج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to AI Applications - Definition and history of AI - Overview of different AI techniques and algorithms
Week 2	Natural Language Processing (NLP) Text preprocessing
Week 3	Introduction to speech recognition
Week 4	Computer Vision Image preprocessing techniques



Week 5	· Image segmentation
Week 6	· Face recognition project
Week 7	AI Applications in Robotics · Perception – what does the environment look like? · Planning and Prediction – how can the robot best navigate the environment?
Week 8	· Control – how can the robot best interact with the objects in the environment?
Week 9	Midterm Exam
Week 10	Game Theory and AI · Introduction to game theory concepts
Week 11	· Game tree representation and analysis
Week 12	· AI strategies in games and simulations
Week 13	AI Applications in Healthcare · Medical imaging and diagnosis using AI
Week 14	AI Applications in Finance · Fraud detection using AI techniques
Week 15	AI Applications in Marketing · Sentiment analysis in social media
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المناهج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Datasets collections , Datasets creation
Week 2	Lab 2: The text preprocessing steps in Python: • Tokenization. • Lower casing. • Stop words removal. • Stemming. • Lemmatization.
Week 3	Lab 3: Speech recognition in Python: • breaks the audio data down into sounds. • analyzes the sounds. • converts the electrical energy from analog to digital, and finally to text.



Week 4	Lab 4: Image Preprocessing Techniques in Python: • Grayscale conversion. • Normalization. • Data Augmentation. • Image standardization.
Week 5	Lab 5: Image segmentation Algorithms • Otsu's Image segmentation (Threshold-based segmentation). • Edge-based image segmentation algorithms - o Robert operator. - o Prewitt operator. - o Sobel operator.
Week 6	Lab 6: Practical Discussion-1 (small project)
Week 7	Lab 7: Robotics perception in python
Week 8	Lab 8: • Robot Planning and Prediction. • Robot Control.
Week 9	Lab 9: NashPy: Strategic Interactions in Python
Week 10	Lab 10: NashPy for model the Static and Dynamic Games
Week 11	Lab 11: chess game implementation using NashPy.
Week 12	Lab 12: Medical Image Classification project
Week 13	Lab 13: Sentiment Analysis using Python project
Week 14	Lab 14: Fraud detection using Python project
Week 15	Lab 15: Practical Discussion-2 (small project)

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Russel, S., & Norvig, P. (2016). Artificial Intelligence: A Modern Approach. Pearson.	yes
Recommended Texts	1. Goodfellow, I., Bengio, Y., & Courville, A. (2016). Deep Learning. MIT Press. 2. LeCun, Y., Bengio, Y., & Hinton, G. (2015). Deep learning. Nature, 521(7553), 436-444. 3. Silver, D., Huang, A., Maddison, C. J., Guez, A., Sifre, L., van den Driessche, G., ... & Hassabis, D. (2016). Mastering	yes

	the game of Go with deep neural networks and tree search. Nature, 529(7587), 484-489.
Websites	1. TensorFlow website: https://www.tensorflow.org/ 2. PyTorch website: https://pytorch.org/ 3. Stanford University CS231n: Convolutional Neural Networks for Visual Recognition: http://cs231n.stanford.edu/

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Communication Skills		Module Delivery
Module Type	Support		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☒ Practical ☒ Seminar
Module Code	HUC-CSIT301		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGII	Semester of Delivery	
Administering Department	CSIT	College	CS
Module Leader	Zaid Sami Mohsen	e-mail	zaid_sami@hilla-unc.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Zaid Sami Mohsen	e-mail	zaid_sami@hilla-unc.edu.iq
Peer Reviewer Name	Non	e-mail	...
Scientific Committee Approval Date	17/12/2025	Version Number	V1

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



Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To understand and apply communication theory 2. To familiarize the students with different styles of communication. 3. To make the students understand the nuances of communication and recognize the effects of diversity, access, and power on communication. 4. To critically think about communication processes and messages. 5. To communicate effectively for a variety of audiences. 6. To Interact skillfully and ethically. 7. To develop and deliver professional presentations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the course, students should be able to: - Communicate effectively for academic purposes. - Apply requisite comm-skills. - Demonstrate understanding of generic fundamentals of communication.
Indicative Contents المحتويات الإرشادية	As an Undergraduate student you will have had experience of communicating sensitively with people in a range social and organizational settings. This course aims to verify and extend these skills and to establish both academic and performative understanding of the core skills of effective communication. Indicative content includes the following: Part A – General Communication Skills [4 hrs] - Introduction to Communication Skills [2 hrs] - Verbal and non-verbal Communication [2 hrs] Part B - Academic Communication [43 hrs] - Listening Skill [7 hrs] - Speaking Skill [7 hrs] - Reading Skill [7 hrs] - Writing Skill [7 hrs] - Presentation Skill [8 hrs] - Study Skill [7 hrs] Part C – Social and Workplace Communication [20 hrs] - Visual Communication [6 hrs] - Employability Skill [7 hrs]



	- Workplace Communication [7 hrs] Part C – Perform Communication [5 hrs] - Student Presentation Discussion [8 hrs]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The lecturer adopts several techniques to communicate with students. These include verbal instructions, picture cues and video. . The lecturer also uses simple hand gestures and facial cues to help students understand what is expected. She has developed strategies to engage students and help them to focus, participate and achieve success in social and workplace communication.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	15	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	55	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	70		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes		25%	2 to 15	
	Assignments		5%	11	
	Projects / Pr.		5%	14	
	Seminar		5%	7	
	Midterm Exam	2hr	10% (10)	10 to 1 to 6	



Summative assessment	Final Exam	3hr	50% (50)	17	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Communication Skills
Week 2	Verbal and non-verbal Communication
Week 3	Listening Skill
Week 4	Speaking Skill
Week 5	Reading Skill
Week 6	Writing Skill
Week 7	Presentation Skill
Week 8	Student Presentation Discussion
Week 9	Student Presentation Discussion
Week 10	Midterm Exam
Week 11	Study Skill
Week 12	Visual Communication
Week 13	Employability Skill
Week 14	Workplace Communication
Week 15	Student Presentation Discussion
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Rutherford, Andrea J. Basic Communication Skills for	



	Technology: Second Edition. Delhi: Pearson Education, 2007. Raman, Meenakshi & Sangeeta Sharma. <i>Technical Communication: Principles and Practice. Second Edition.</i> New Delhi: Oxford University Press, 2011. Thorpe, Edgar & Showick Thorpe. Winning at Interviews. 2nd Edition. Delhi: Dorling Kindersley, 2006. Kratz, Abby Robinson. <i>Effective Listening Skills.</i> Toronto: ON: Irwin Professional Publishing, 1995. Hughes, Shirley. <i>Professional Presentations: A Practical Guide to the Preparation and Performance of Successful Business Presentations.</i> Sydney: McGraw-Hill, 1990	
Recommended Texts		
Websites	http://networketiquette.net/ http://users3.ev1.net/~pamthompson/body_language	



	ge.htm http://www.albion.com/n etiquette/corerules.html http://www.colostate.edu/Depts/Speech/rccs/theory44.html http://www.dailywritingtips.com/ 4 http://www.englishdaily626.com/c-errors.php http://www.indiabix.com/group-discussion/topics-with-answers/ http://www.owlnet.rice.edu/~cainproj http://www.thehumorsource.com http://zzyx.ucsc.edu/~archer/intro.html
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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.

