MODULE DESCRIPTION FORM

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

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

Module Aims, Learning Outcomes, and Indicative Contents	
Module Aims	This course is an introductory survey of artificial intelligence. The course will cover the history, theory, and computational methods of artificial intelligence. Basic concepts include Logic, Theorem-Proving, knowledge representation and reasoning, AI search techniques, and Problems Solving. One or two application areas will be studied, selected from expert systems, robotics, computer vision, natural language understanding, and planning.
Module Learning Outcomes	Provide the student with key vocabulary and help to understand artificial intelligence and expert systems by: • Understand artificial intelligence and expert systems and apply their basic concepts.

	• Realizing the importance of artificial intelligence and expert systems in practical life • Developing the concepts of artificial intelligence and expert systems and trying to reach new concepts.
Indicative Contents	Indicative content includes the following. Theoretical direction Explain the foundations of Artificial intelligence (AI). Where AI represents the behavior of specific characteristics of the program that make it simulate human mental capabilities and work patterns. Among the most important characteristics is the ability to learn, reason, and react to a situation that is not programmed into the machine.. [6 hrs] Knowledge representation: To create programs with "intelligent" qualities, developing techniques for representing knowledge is necessary. Unlike people, computers cannot acquire knowledge on their own. The Al programs use knowledge structures to describe objects, facts, rules, relationships, and procedures. The primary function of the knowledge structure is to provide the needed expertise and information so that a program can operate intelligently. Knowledge structures usually comprise traditional data structures and other complex structures such as Logical frames, scripts, semantic networks, conceptual graphs, and ATN(augment transition network. [9 hrs] Automatic Theorem Proving: It's called the Resolution technique for theorem proving in propositional and predicate calculus, which attempts to show that the statement's negation contradicts the general ideas. [12 hrs] Intelligent Search Methods and Strategies search is inherent to the problem and methods of Artificial Intelligence (AI). This is because AI problems are intrinsically complex. Efforts to solve problems with computers which humans can routinely innate cognitive abilities, pattern recognition, perception, and experience, invariably must turn to considerations of search. All search methods essentially fall into one of two categories, exhaustive (blind) methods, and heuristic or informed methods. [12 hrs] Introduction to Expert Systems: understand the expert systems and how they can build their software to solve the applications. [9 hrs] Revision problem classes [6 hrs]

	Part B - Practical direction An Introduction to Python with Beginning Python Basics and Python Program Flow. [8 hrs] Functions& Modules, Exceptions Handling, Exceptions Handling, and Classes in python. [8 hrs]. Generators and iterators and Data Structures in Python. [12 hrs] Using Python in Automatic Theorem Proving, and in Intelligent Search Methods. [12 hrs]

Learning and Teaching Strategies	
Strategies	The primary strategy adopted in delivering this course is to encourage student participation in the exercises while simultaneously refining and expanding their skills in the artificial intelligence field. This will be achieved through classes and scientific laboratories.

Student Workload (SWL)			
Structured SWL (h/sem)	75	**Structured SWL (h/w)**	5
Unstructured SWL (h/sem)	100	**Unstructured SWL (h/w)**	6.5
Total SWL (h/sem)	175		

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

Total assessment	100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1, 2	Foundations of Artificial Integument (AI) : • An introductory survey of AI. • History, theory of AI. • Philosophy of Intelligent • AI properties • Targets of AI • Applications of AI • Characteristics of the languages of AI • AI problems • Intelligent measures • Why we are study AI
Week 3-5	Knowledge Representation: • Knowledge Base in AI • Knowledge representation schemes in AI • Logical representation • Procedural representation • Network representation • Structured representation
Week 6 7	Automatic Theorem Proving • What is the theorem proving • How can use theorem proving to prove the theorems.
Week 8-12	Intelligent Search Methods and Strategies in AI • State Space Search • General Problem Solving Approaches • Search Techniques • Blind Search • Heuristic Search • Solving of some real problems
Week 13-14	What are Expert Systems? • Characteristics of Expert Systems • Capabilities of Expert Systems • Components of Expert Systems • Knowledge Base • Inference Engine • Expert Systems Limitations • Applications of Expert System
Week 15	The preparatory week before the final exam

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	An Introduction to Python with Beginning Python Basics • What can Python do? • Why Python? • Good to know • Python Syntax compared to other programming languages • Python Install • The print statement • Comments • Python Data Structures & Data Types • String Operations in Python • Simple Input & Output • Simple Output Formatting • Operators in python
Week 2	Python Program Flow • Indentation • The If statement and its' related statement • An example with if and it's related statement • The while loop • The for loop • The range statement • Break &Continue • Assert • Examples for looping
Week 3,4	Functions& Modules • Create your own functions • Functions Parameters • Variable Arguments • Scope of a Function • Function Documentations • Lambda Functions& map • n Exercise with functions • Create a Module • Standard Modules
Week 5	Exceptions Handling • Errors • Exception handling with try • handling Multiple Exceptions • Writing your own Exception
Week 6,7	Classes In Python • New Style Classes • Creating Classes • Instance Methods • Inheritance • Polymorphism • Exception Classes & Custom Exceptions

Week 8,9	Generators and iterators and Data Structures • Iterators • Generators • The Functions any and all • With Statement • Data Compression • List Comprehensions • Nested List Comprehensions • Dictionary Comprehensions • Functions • Default Parameters • Variable Arguments • Specialized Sorts
Week 10,11	Using Python in Automatic Theorem Proving
Week 12,14	Using Python in Intelligent Search Methods

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	1. Wolfgang Ertel (2011). Introduction to Artificial Intelligence. Springer-Verlag London. 2. Stuart Russell, Peter Norvig (2010). Artificial Intelligence: A Modern Approach, 3rd Edition (Prentice Hall Series in Artificial Intelligence). 3rd ed. Pearson Education.	Yes
Recommended Texts		No
Websites	https://collegedunia.com/courses/python/syllabus https://www.udemy.com/course/core-python-3-and-oop-course-for-absolute-beginners/	

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

MODULE DESCRIPTION FORM

Module Information					
Module Title	**Computer Networking 1**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☒**Lecture** ☒**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code					
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	3		**Semester of Delivery**	1	
Administering Department	Computer Science		**College**	Computer Science and Information Tech.	
Module Leader	Imad Shalaan Alshawi		**e-mail**	emad.alshawi@uobasrah.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes, and Indicative Contents	
Module Aims	This course provides a technical and operational overview of digital computer networks, the foundation for all modern information systems and services.
Module Learning Outcomes	The student will learn about the major software and hardware technologies used on home and enterprise computer networks and the global Internet. The student will understand how information is in digital packets and transported across local networks and other global networks interconnecting over the Internet backbone.
Indicative Contents	Indicative content includes the following. Theoretical direction

	Introduction: Data communications, classification of computer networks, computer network topologies, communication protocols, and standards, layered tasks, the OSI model and layers, TCP/IP protocol suite, addressing. [6 hrs] In Physical Layer: Data and signals, analog and digital, analog and digital signals, signals and communication, digital signals, transmission of digital signals, transmission impairments, data rate limits and transmission and performance, digital to digital conversion, , connecting devices: Hub, Switches, Repeaters, Bridges, Routers, Gateways and Routers. [9 hrs] In Data Link Layer: Error detection and correction: introduction, CRC and checksum, framing, flow and error control. [6 hrs] In Network Layer: Class full and classless addressing, internetworking, routing concepts, IP routing, routing table, routing components, routing algorithm types (Static V.S. Dynamic, Source routing V.S. Hop-by-hop, Centralize V.S. Distributed, and Distance vector V.S. Link state). [9 hrs] In Transport Layer: Process to process delivery, Protocols: UDP, TCP and SCTP, congestion control, quality of service. [6 hrs] In Application Layer Functionality and Protocols: How do the functions of the three upper OSI model layers provide network services to end-user applications?, How do the TCP/IP application layer protocols provide the services specified by the upper layers of the OSI model?, How do people use the application layer to communicate across the information network?, What are the functions of well-known TCP/IP applications, such as the World Wide Web and e-mail, and their related services (HTTP, DNS, DHCP, STMP/POP, and Telnet)?. [9 hrs] Revision problem classes [6 hrs] <u>Part B - Practical direction</u> Fundamentals Study of different types of Network cables and practically implements the cross-wired cables and straight-through cables using a clamping tool. [8 hrs] Study of network addressing and How to connect the computers to LAN. [8 hrs]

	Introduction to packet tracer program [8 hrs] Learn how basic switch and router configuration. Also, Learn router configuration in small network. [15 hrs]

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

Student Workload (SWL)			
Structured SWL (h/sem)	75	**Structured SWL (h/w)**	5
Unstructured SWL (h/sem)	75	**Unstructured SWL (h/w)**	5
Total SWL (h/sem)	150		

Module Evaluation

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

Delivery Plan (Weekly Syllabus)

	Material Covered

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

Delivery Plan (Weekly Lab. Syllabus)

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

Week 11,12	Lab 6: Basic switch & router configuration
Week 13,14	Lab 7: Router configuration in small network

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

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

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**CS208**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1- To understand and explain the main techniques and algorithms used in compilers. 2- To understand, design and implement a lexical analyzer. 3- To understand, design and implement a Syntax Analysis. 4- To understand, design and implement a parser. 5- To understand, design code generation schemes.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Learn about compilers and interpreters. 2- Explain the main techniques and algorithms used in compilers. 3- Describe an application of regular expressions in lexical scanners. 4- Discuss the hand coded scanner and automatically generated a scanner. 5- Explain the formal definition of tokens. 6- Describe finite state automata. 7- Explain the revision of formal definition of grammars. 8- Explain BNF and EBNF. 9- Describe the Bottom ¬ up and top ¬ down parsing. 10- Explain tabular, recursive, and descent parsers. 11- Learn about error handling. 12- Describe the automatic generation of tabular parsers, symbol table. management, and the use of tools in support of the translation process.
Indicative Contents المحتويات الإرشادية	1- Introduction to Compilers: The role of language translation in the programming process; 2- Comparison of interpreters and compilers, language translation phases, machine dependent and machine independent aspects of translation, language translation as a software engineering activity 3- Lexical Analysis: Application of regular expressions in lexical scanners, hand coded scanner vs. automatically generated a scanner, formal definition of tokens 4- Implementation of finite state automata. 5- Syntax Analysis: Revision of formal definition of grammars, BNF and EBNF, Bottom ¬ up, top ¬ down parsing, … 6- Parsers Implementation: automatic generation of tabular parsers, symbol table management, the use of tools in support of the translation process, 7- Project presentation1

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Employing these strategies can create a comprehensive and engaging learning experience in compiler construction module, such as lectures, interactive discussions, hands-on lab sessions, case studies, assignments, projects, guest lectures, online resources, assessments, group projects, and continuous support.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	73	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1,# 2,#3,#4, #11 and #11
	Assignments	2	10% (10)	2, 12	LO #5,#7, and #8, #10
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 6,#7, #8,#9
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-#7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

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

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1+2	Implementation of strings
Week 3+4+5	Implementation of regular expression and Finite state automata
Week 6+7+8	Implementation of a lexical analyzer
Week 9+10	Implementation of a symbol table
Week 11+12+13	Implementation of a basic parser (3 weeks)
Week 14+15	Design of a compiler for simple language (project)

00Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Aho, Alfred V. *Compilers: Principles, Techniques and Tools (for Anna University), 2/e*. Pearson Education India, 2007.	
Recommended Texts	W. Appel, Modern Compiler Implementation in Java, Prentice Hall, 2002	
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**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☒**Lecture** ☒**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code					
ECTS Credits	**6**				
SWL (hr/sem)	**150(6*25**				
Module Level		3	**Semester of Delivery**		2
Administering Department		CS	**College**	CSIT	
Module Leader	**DR.Zainab N.Nemer**		**e-mail**	E-mail	
Module Leader's Acad. Title		Assist prof.	**Module Leader's Qualification**		Ph.D.
Module Tutor			**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**Version Number**		1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To develop problem solving skills and understanding techniques of teams. 2. This course deals with the basic concept of software engineering. 3. This is the basic subject for requirements, development and all SDLC. 4. To understand unified modeling language UML. 5. To understand management activities in software.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. How to apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment. 2. An ability to work in one or more significant application domains 3. Work as an individual and as part of a multidisciplinary team to develop and deliver quality software. 4. Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle. 5. Demonstrate an ability to use the techniques and tools necessary for engineering practice. 6. Construct software project to apply the knowledge. 7. The students study planning and design of software including development processes, life-cycle models, quality issues, requirements analysis, design techniques, testing, and project management.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - introduction</u> General introductory courses in software engineering the first part have been designed explicitly to support a one-semester course in introductory. software engineering Define software, software system, software engineering, products, project, what are the differences between computer science and software engineering [8 hrs.] Professional software development, Software engineering ethics, Case studies. [7 hrs]

	Agile software development, Agile methods, Plan-driven and agile development, Extreme programming, Agile project management, Scaling agile methods [15 hrs] Requirements engineering, Functional and non-functional requirements, The software requirements document, Requirements specification, Requirements engineering processes, Requirements elicitation and analysis, Requirements validation, Requirements management [15 hrs] <u>Part B -</u> System modeling, Context models, Interaction models, Structural models, Behavioral models, Model-driven engineering. [8hrs] Project planning, Software pricing, Plan-driven development, Project scheduling, Agile planning, Estimation techniques. [7 hrs]

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

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) **((2lectur+2lab)*15weeks)** الحمل الدراسي المنتظم للطالب خلال الفصل	60	**Structured SWL (h/w)** **(60\15 week)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) **(150-60)** الحمل الدراسي غير المنتظم للطالب خلال الفصل	90	**Unstructured SWL (h/w)** **(90\15 week)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Team working
Week 2	Software project planning
Week 3	Software Methods
Week 4	Software Requirements Gathering
Week 5	Functional Modeling: Use Cases and Activity Diagrams
Week 6	Structural Modeling: domain modeling

Week 7	Structural Modeling: system classes
Week 8	First exam
Week 9	Behavioral modeling
Week 10	Introduction to User Interface Design
Week 11	System Design: Software design based on GRASP principles
Week 12	System Design: Software System Architecture
Week 13	System Implementation: Verification and validation of software systems
Week 14	System Implementation: tools
Week 15	Second exam
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to java
Week 2	Lab 2: design interface in java
Week 3	Lab 3: build database in java
Week 4	Lab 4: suggest a project to work on it throw the latest weeks
Week 5	Lab 5: implement software activities on the project
Week 6	Lab 6: implement software activities on the project
Week 7	Lab 7: test the project

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	SOFTWARE ENGINEERING Ninth Edition Ian Sommerville	no
Recommended Texts	-	
Websites	-http://www.SoftwareEngineering-9.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	**Operations Research**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☒**Lecture** ☐**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**UoB12345**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level	3		**Semester of Delivery**	2	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Name		**e-mail**	Nasir.jasim@uobasrah.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Modeling realistic problems with different mathematical formulas. 2. Finding a solution to any problem available in the labor market after modeling it using different methods of solution. 3. Searching for the best solution to the problem and searching for the best method used to deliver the product to the labor market.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**Cognitive goals** 1. Enable the student to identify problems in the labor market. 2. The student's ability to model realistic problems. 3. Enabling the student to solve any problem he encounters in the labor market by converting it into a mathematical model and solving it in one of the solutions. **Skill objectives for the course** 1. Work as a member of a team to solve any problem in the market. 2. Understanding mathematics through practice
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A – Linear Programming Constructing Linear Programming Models, Forms of Linear programming model, The formulation of linear programming Model, Method of solution of Linear programming Model. [8hrs] Part B - Method of solution of Linear programming Model Graphical method , Simplex Method. [8 hrs] Part C - Artificial Variable Technique, Duality in Linear Programming Two Phase Method, Duality and simplex method [9 hrs]

	Part D – Transportation Problems Method for Initial Basic Feasible Solution to a transportation problems, North-West Corner Rule, Least Cost Method, Vogel's Approximation Method, Testing initial basic feasible solution and obtain by it the optimal solution, Stepping Stone Method, Modified Distribution method. [10 hrs] Part E – Assignment Problems [6 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Providing distinguished educational and research services that keep pace with local and international quality standards in the fields of computer and informatics. These services allow preparing a distinguished, competitive graduate. In addition to that, the completion of high-end scientific research and effective participation in community service and building a knowledge-based economy.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem)	**200**		

الحمل الدراسي الكلي للطالب خلال الفصل	

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction – Linear programming Models, Forms of Linear programming Models
Week 2	Application Examples , Graphical Methods for Solving Linear Programming Models
Week 3	Simplex Method
Week 4	Solving Linear Programming Problems by Simplex Method
Week 5	Artificial Variable Technique

Week 6	Duality in Linear Programming Problem
Week 7	Duality and Simplex Method
Week 8	Assignment 1
Week 9	Transportation Problems
Week 10	Initial Basic Feasible Solution of Transportation problems
Week 11	Optimal Solution of Linear Programming Problems
Week 12	Unbalanced Transportation Problem
Week 13	Assignment 2
Week 14	Assignment Problems
Week 15	**The Hungarian Method for Assignment Problem**
Week 16	**Preparatory week before the final Exam**

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

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Makebest Decisions Through Operations Research, S.D.SHARMA	Yes
Recommended Texts	Prem Kumar Gupta, D.S. HIRA, S.CHAND بحوث العمليات ((مفهوما وتطبيقا) تأليف الدكتور حامد سعد نور الشمرتي	Yes
Websites		

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

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

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

Module Aims, Learning Outcomes, and Indicative Contents	
Module Aims	The course is a research-based course and therefore focuses on leading students to investigate the current state of research in Computational Intelligent areas as well as to gain comprehensive theoretical knowledge from scientific research about the basic concepts and features of CI methodologies and approaches.

Module Learning Outcomes	Provide the student with key vocabulary and help to understand artificial intelligence and Computational intelligence by understand:
	• Optimization
	  ○ Constrained, unconstrained optimization
	  ○ Parameter space, function space, and fitness space
	  ○ Local and global optima
	  ○ Multi-objective optimization

	• Classification / Learning
	  ○ Classification (Supervised Learning)
	  ○ Clustering (Unsupervised Learning)
	  ○ Reinforcement Learning
	• Control Systems

Indicative Contents	Indicative content includes the following. <u>Theoretical direction</u> Introduction to Computational Intelligent topics fundamental concepts. [6 hrs] Neural Networks (NNs): A neural network is a method in artificial intelligence that teaches computers to process data in a way that is inspired by the human brain. It is a type of machine learning process, called deep learning that uses interconnected nodes or neurons in a layered structure that resembles the human brain. [9 hrs] Fuzzy Logic (FL): Fuzzy logic is a form of many-valued logic in which the truth value of variables may be any actual number between 0 and 1. It is employed to handle the concept of partial truth, where the truth value may range between entirely true and false. By contrast, in Boolean logic, the truth values of variables may only be the integer values 0 or 1. [9 hrs] Genetic Algorithms (GAs): In computer science and operations research, a genetic algorithm (GA) is a meta-heuristic inspired by the process of natural selection that belongs to the larger class of evolutionary algorithms (EA). Genetic algorithms are commonly used to generate high-quality solutions to optimization and search problems by relying on biologically inspired operators such as mutation, crossover, and selection. Some examples of GA applications include optimizing decision trees for better performance, solving Sudoku puzzles, hyper-parameter optimization, causal inference, etc.. [9 hrs] Swarm Intelligence: Swarm intelligence (SI) is the collective behavior of decentralized, self-organized, natural, or artificial systems. The concept is employed in work on artificial intelligence. SI systems typically consist of a population of simple agents or boids interacting locally with one another and with their environment. The inspiration often comes from nature, especially biological systems. The agents follow straightforward rules, and although there is no centralized control structure dictating how individual agents should behave, local and to a certain degree, random interactions between such agents lead to the emergence of "intelligent" global

	behavior unknown to the individual agents. Examples of swarm intelligence in natural systems include ant colonies, bee colonies, bird flocking, hawks hunting, animal herding, bacterial growth, fish schooling, and microbial intelligence. [9 hrs] Revision problem classes [6 hrs] Part B - Practical direction by Python Introduction to Python for AI . [6 hrs] Applying python of same of NN applications. [9 hrs]. Applying python of same of Fuzzy applications. [9 hrs] Applying python of same of GAs applications. [9 hrs] Applying python of same of Swarm Intelligent applications. [9 hrs] Applying python of same of Hybridization of CI Algorithms applications. [6 hrs]

Learning and Teaching Strategies	
Strategies	The primary strategy adopted in delivering this course is to encourage student participation in the exercises while simultaneously refining and expanding their skills in the artificial intelligence field. This will be achieved through classes and scientific laboratories.

Student Workload (SWL)			
Structured SWL (h/sem)	75	**Structured SWL (h/w)**	5
Unstructured SWL (h/sem)	100	**Unstructured SWL (h/w)**	6.5
Total SWL (h/sem)	175		

Module Evaluation

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

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Introduction to Computational Intelligent topics fundamental concepts.
Week 2, 4	Neural Networks (NNs) • Introduction to NN • Supervised, and unsupervised learning, • NN training algorithms, training rules, • Back propagation algorithm • Applications of NNs.
Week 5-7	Fuzzy Logic (FL) • Introduction to FL • Classical and fuzzy sets: Overview of classical sets • Membership function • Fuzzy rule generation. • Operations on Fuzzy Sets: Compliment, Intersections, Unions, Combinations of Operations • Fuzzy Arithmetic, Linguistic Variables, Arithmetic Operations. • Applications of FL.
Week 8 10	Genetic Algorithms (GAs) • Introduction to GAs • Genetic Operators and Parameters • GAs in problem solving • Theoretical foundations of genetic algorithms, implementation issues. • Applications of GAs
Week 11-13	Swarm Intelligence • Particle Swarm Optimization (PSO). • Overview of Ant Colony Algorithm, and Bee Colony Algorithm.
Week 14	Hybridization of CI Algorithms. • Applications of Hybrid CI algorithms
Week 15	The preparatory week before the final exam

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	Introduction to Python for AI
Week 2-4	Applying python of same of NN applications
Week 5-7	Applying python of same of Fuzzy applications
Week 8-10	Applying python of same of GAs applications
Week 11-13	Applying python of same of Swarm Intelligent applications
Week 14,15	Applying python of same of Hybridization of CI Algorithms applications

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

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

MODULE DESCRIPTION FORM

Module Information					
Module Title	**Computer Networking 2**			**Module Delivery**	
Module Type	**Core**			☒Theory ☒Lecture ☒Lab ☐Tutorial ☐Practical ☐Seminar	
Module Code					
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level		3	**Semester of Delivery**		2
Administering Department		Computer Science	**College**	Computer Science and Information Tech.	
Module Leader	Imad Shalaan Alshawi		**e-mail**	emad.alshawi@uobasrah.edu.iq	
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**		1.0

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

Module Aims, Learning Outcomes, and Indicative Contents	
Module Aims	This course introduces the architecture, structure, functions, components, and models of the Internet and other computer networks. The principles and design of IP addressing and the fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for the curriculum..
Module Learning Outcomes	At the end of the course, the students will be able to: • Understand and describe the devices and services used to support communications in data networks and the Internet • Understand and describe the role of protocol layers in data networks • Understand and describe the importance of addressing and naming schemes at various layers of data networks in IPv4 and IPv6 environments

	• Design, calculate, and apply subnet masks and addresses to fulfill given requirements in IPv4 and IPv6 networks • Explain fundamental Ethernet concepts, such as media, services, and operations • Build a simple Ethernet network using routers and switches • Use Cisco command-line interface (CLI) commands to perform basic router and switch configurations • Utilize standard network utilities to verify small network operations and analyze data traffic.
Indicative Contents	Indicative content includes the following. Introduction to explain how multiple networks are used in everyday life. Describe the topologies and devices used in a small to medium-sized business network. Explain the essential characteristics of a network that supports communication in a small to medium-sized business. Explain networking trends that will affect network use in small to medium-sized companies. [8 hrs] Explain the features and functions of Cisco IOS Software. Configure initial settings on a network device using the Cisco IOS software. Given an IP addressing scheme, configure IP address parameters on end devices to provide end-to-end connectivity in a small to medium-sized business network. [9 hrs] Explain how rules facilitate communication. Explain the role of protocols and standards organizations in facilitating interoperability in network communications. Explain how devices on LAN access resources in a small to medium-sized business network.. [8 hrs] Explain how physical layer protocols and services support communications across data networks. Build a simple network using the appropriate media. Explain the role of the data link layer in supporting communications across data networks. Compare media access control techniques and logical topologies used in networks. [9 hrs] Explain the operation of Ethernet. Explain how a switch operates. Explain how the address resolution protocol enables communication on a network. [6 hrs] Explain the use of IPv4 addresses to provide connectivity in small to medium-sized business networks. Configure IPv6 addresses to provide connectivity in small to medium-sized business networks. Use standard testing utilities to verify and test network connectivity. [9 hrs] Implement an IPv4 addressing scheme to enable end-to-end connectivity in a small to medium-sized business network. Given a set of requirements, implement a VLSM

	addressing plan to connect end users in a small to medium-sized network. Explain design considerations for implementing IPv6 in a business network. [6 hrs] Explain how transport layer protocols and services support communications across data networks. Compare the operations of transport layer protocols in supporting end-to-end communication. [8 hrs] Explain the operation of the application layer in providing support to end-user applications. Explain how well-known TCP/IP application layer protocols operate. [8 hrs] Explain the features and functions of Cisco IOS Software. Configure initial settings on a network device using the Cisco IOS software. Given an IP addressing scheme, configure IP address parameters on end devices to provide end-to-end connectivity in a small to medium-sized business network. [8 hrs]

Learning and Teaching Strategies	
Strategies	The primary strategy adopted in delivering this course is to encourage students' participation in the exercises while simultaneously refining and expanding their skills in the networking field. This will be achieved through classes and scientific laboratories. In addition to exploring the capabilities and limitations of today's most popular networks, including Ethernet, Wi-Fi, and cellular, it also covers topics closely related to networks. By the end of the course, students will be able to build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes.

Student Workload (SWL)			
Structured SWL (h/sem)	75	**Structured SWL (h/w)**	5
Unstructured SWL (h/sem)	75	**Unstructured SWL (h/w)**	5
Total SWL (h/sem)	150		

Module Evaluation

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

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1, 2	Explore the Network
Week 3-4	Configure a Network Operating System
Week 5,7	Network Protocols and Communications, and Network Access
Week 8	Ethernet
Week 9-11	Network Layer, IP Addressing, and Subnetting IP Networks
Week 12	Transport Layer
Week 13	Application Layer
Week 14	Build a Small Network
Week 15	The preparatory week before the final exam
Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	Lab 1: Packet Tracer Program
Week 2	Lab 2: Switch & Router Configuration.
Week 3,4	Lab 3: Router Configuration Networks
Week 5,6	Lab 4: Address Resolution Protocol ARP and Reverse Address Resolution Protocol RARP
Week 7	Lab 5: Domain Name Service (DNS)
Week 8,9	Lab 6: Dynamic Host Control Protocol (DHCP)
Week 10	Lab 7: Virtual Local Area Network (VLAN)
Week 11,12	Lab 8: Configure a Network using Distance Vector Routing protocol.
Week 13,14	Lab 9: Configure a Network using Link State Routing protocol

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Visual Programming**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☒**Lecture** ☒**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**CS303**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	3		**Semester of Delivery**	1	
Administering Department	Computer Science department		**College**	College of computer science and information technology	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	6. Ability to demonstrate knowledge of interface design principles and be able to apply them in a visual programming environment. 7. The student should have knowledge of Object Oriented Concepts and how to implement them in a visual programming environment.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A- Cognitive goals 8. Transforming the vision and path of traditional programming concepts towards visual programming 9. Expanding the student's knowledge from the idea of scattered small programs to an integrated application 10. Expanding the student's knowledge of Object Oriented 11. Expanding the student's knowledge towards programming the use of sound, images and video for presentation requirements B - The soft skills objectives of the course. 1. Developing the student's skills in searching for ideas to present as proposals for discussion to implement simplified projects 2. Developing the student's programming skills through implementing some of the ideas presented and discussed, such as: 3. Programming some games or educational programs in a smooth and useful review manner.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. VB.Net is considered an event-driven language that is easy to learn and write code. It is designed to foster rapid application development (RAD), where the application prototype can be developed first with less focus on writing complex codes in the initial stages of the development cycle. In a course, you will build on existing knowledge of the design process to carry out a project, which will integrate elements of user interface, user experience and service design. In a course, introduced you to the basics of designing applications with Visual Studio 2012 and the components of the Visual Basic language. You know how to design graphical user interfaces (GUIs) and how to use Visual Basic statements to program events for the various controls. You also know how to write functions and subroutines and how to call the functions and subroutines that are built into Visual Basic.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Readings, self-learning, panel discussions. - Classroom exercises and activities. - Guiding students to some websites to benefit from them to develop abilities. - Holding research seminars through which some problems are explained and analyzed and the mechanism for finding solutions. Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
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	150		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction visual programming
Week 2	Fundamental Object Types
Week 3	Fundamental Object Types
Week 4	Event-driven Programming
Week 5	Variables & Constants & Operators
Week 6	Control Structures
Week 7	Loops
Week 8	Input / Output Boxes
Week 9	Array
Week 10	Built in Functions
Week 11	Date and Time
Week 12	ListBox Control & ComboBox Control
Week 13	RadioButton Control & CheckBox Control
Week 14	Sub Functions
Week 15	Sub Procedures

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction on Environment
Week 2	Lab 2: Fundamental Object Types & Event
Week 3	Lab 3: Fundamental Object Types & Event
Week 4	Lab 4: Input / Output Boxes
Week 5	Lab 5: Built in Functions
Week 6	Lab 6: Date and Time
Week 7	Lab 7: ListBox Control
Week 8	Lab 8: ComboBox Control
Week 9	Lab 9: RadioButton Control
Week 10	Lab 10: CheckBox Control
Week 11	Lab 11: Control Structures
Week 12	Lab 12: Loops
Week 13	Lab 13: Array
Week 14	Lab 14: Sub Functions
Week 15	Lab 15: Sub Procedures

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Recommended Texts	The Complete Reference Visual Basic .NET	
Recommended Texts	Programming Visual Basic .NET	
Recommended Texts	An Introduction to Programming Using Visual Basic 2012	

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 Technologies**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☒**Lecture** ☒**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code					
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	3		**Semester of Delivery**	2	
Administering Department			**College**	CSIT	
Module Leader	Dr. Raad A. Muhajjar		**e-mail**	Raad.muhajjar@uobasrah.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	15/06/2023		**Version Number**	1.0	

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

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

Module Objectives أهداف المادة الدراسية	1. Understanding PHP Basics: Learn the fundamentals of PHP programming language, including syntax, variables, data types, operators, control structures, and functions. 2. Web Development Concepts: Gain an understanding of web development concepts such as client-server architecture, HTTP protocol, request/response cycle, and the role of PHP in web development. 3. Working with HTML and CSS: Learn how to integrate PHP code within HTML and CSS to create dynamic web pages. Understand how to generate HTML content using PHP and manipulate CSS styles based on dynamic conditions. 4. Handling Form Data: Explore techniques for handling form submissions using PHP. Learn how to retrieve form data, validate and sanitize input, and perform server-side form processing. 5. Working with Databases: Understand the basics of database management systems and how to interact with databases using PHP. Learn how to establish database connections, execute SQL queries, and handle result sets. 6. Session and Cookies Management: Explore techniques for managing user sessions and cookies using PHP. Learn how to create, store, and retrieve session data, as well as how to implement user authentication and authorization. 7. File Handling: Gain knowledge on file handling operations in PHP, such as reading from and writing to files, uploading files, and manipulating file metadata. 8. Working with APIs: Understand the concepts of Application Programming Interfaces (APIs) and learn how to interact with external APIs using PHP. Explore techniques for consuming and integrating data from popular APIs.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	When completing a web programming module focused on PHP, the student can gain the following learning outcomes: 1. Basic PHP Knowledge: Demonstrate a solid understanding of PHP syntax, variables, data types, operators, control structures, and functions. 2. Dynamic Web Page Creation: Develop the ability to integrate PHP code with HTML and CSS to create dynamic web pages that can generate and manipulate content based on user input or database interactions. 3. Form Handling: Successfully handle form submissions using PHP by retrieving form data, validating and sanitizing input, and performing server-side form processing. 4. Database Interaction: Exhibit competence in establishing connections with databases, executing SQL queries, handling result sets, and implementing basic database operations such as inserting, updating, and deleting data. 5. Session and Cookies Management: Implement session and cookies management techniques in PHP to maintain user sessions, store user data, and implement basic user authentication and authorization functionalities.

	6. File Handling: Acquire skills in reading from and writing to files, uploading files, and manipulating file metadata using PHP. 7. API Integration: Demonstrate the ability to consume data from external APIs, understand API documentation, and effectively integrate API functionality into PHP-based web applications.
Indicative Contents المحتويات الإرشادية	• Introduction to PHP: a. PHP syntax and basic language constructs b. Variables, data types, and operators c. Control structures (conditionals, loops) d. Functions and procedural programming • Web Development Basics: a. Client-server architecture and HTTP protocol b. Request/response cycle c. Introduction to HTML and CSS d. Integrating PHP with HTML and CSS • Form Handling and Validation: a. Creating HTML forms b. Handling form submissions with PHP c. Validating and sanitizing user input d. Displaying form errors and feedback • Database Interaction with PHP: a. Introduction to relational databases (e.g., MySQL) b. Establishing database connections in PHP c. Executing SQL queries with PHP d. Handling result sets and retrieving data • Session Management and Authentication: a. Understanding sessions and cookies b. Managing user sessions in PHP c. Implementing user authentication and authorization d. Securing sensitive data and preventing session hijacking • File Handling and Uploading: a. Reading from and writing to files with PHP b. Handling file uploads and validating file types

	c. Manipulating file metadata (e.g., resizing images) d. File system operations and directory handling • Working with APIs a) Introduction to APIs and their usage in web development b) Making API requests with PHP c) Parsing and manipulating API responses (JSON, XML) d) Integrating data from popular APIs (e.g., Google Maps, Twitter)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Employing these strategies can create a comprehensive and engaging learning experience in a web programming module, such as lectures, interactive discussions, hands-on lab sessions, case studies, assignments, projects, guest lectures, online resources, assessments, group projects, and continuous support.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (hr/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	**Structured SWL (hr/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (hr/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	**Unstructured SWL (hr/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (hr/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to PHP • PHP syntax and basic language constructs • Variables, data types, and operators
Week 2	Introduction to PHP • Control structures (conditionals, loops) • Functions and procedural programming
Week 3	Web Development Basics: • Client-server architecture and HTTP protocol • Request/response cycle
Week 4	Web Development Basics:

	• Introduction to HTML and CSS • Integrating PHP with HTML and CSS
Week 5	Form Handling and Validation: • Creating HTML forms • Handling form submissions with PHP
Week 6	Form Handling and Validation: • Validating and sanitizing user input • Displaying form errors and feedback
Week 7	Database Interaction with PHP: • Introduction to relational databases (e.g., MySQL) • Establishing database connections in PHP
Week 8	Database Interaction with PHP: • Executing SQL queries with PHP • Handling result sets and retrieving data
Week 9	Session Management and Authentication: • Understanding sessions and cookies • Managing user sessions in PHP
Week 10	Session Management and Authentication: • Implementing user authentication and authorization • Securing sensitive data and preventing session hijacking
Week 11	File Handling and Uploading: Reading from and writing to files with PHP Handling file uploads and validating file types
Week 12	File Handling and Uploading: Manipulating file metadata (e.g., resizing images) File system operations and directory handling
Week 13	Working with APIs • Introduction to APIs and their usage in web development • Making API requests with PHP

Week 14	Working with APIs • Parsing and manipulating API responses (JSON, XML) • Integrating data from popular APIs (e.g., Google Maps, Twitter)
Week 15	Project Presentations and Wrap-up • Group project presentations • Discussion and reflection on the course
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	• Setting up the development environment (XAMPP, WAMP, etc.)
Week 2	• Writing basic PHP scripts, Variable declaration and manipulation
Week 3	• Applying predefined functions (string & math)
Week 4	• Creating a simple HTML webpage, Embedding PHP code within HTM , Displaying dynamic content with PHP
Week 5	• Creating a form with HTML, Processing form data with PHP
Week 6	• Implementing form validation and error handling
Week 7	• Setting up a local database server (MySQL, MariaDB, etc.), Establishing a database connection in PHP
Week 8	• Executing SQL queries and retrieving data
Week 9	• Implementing user registration and login functionality, Managing user sessions using PHP
Week 10	• Implementing basic authentication and access control
Week 11	• Uploading files with PHP, Validating and storing uploaded file.
Week 12	• Displaying uploaded files on a webpage
Week 13	• Making API requests using PHP, Parsing and processing API responses (JSON, XML),integrating external API data into a web application
Week14	• Project Discussion

Week15	• Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Textbook: 1. PHP and MySQL Web Development" by Luke Welling and Laura Thomson, addison-Wesley Professional, 2016 2. "Modern PHP: New Features and Good Practices" by Josh Lockhart, 2015	Yes (E-copy)
Recommended Texts	PHP for the Web: Visual Quick Start Guide" by Larry Ullman:	Yes (E-copy)
Websites	W3Schools PHP Tutorial: (www.w3schools.com/php)	

Grading Scheme

مخطط الدرجات

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