Ministry of Higher Education and Scientific Research

Scientific Ssupervision and Evaluation device

Department of Quality Assurance and Academic Accreditation

International Accreditation Department

Academic Program Description Form

University Name: University of Babylon

College/Institute: College of Science for Women

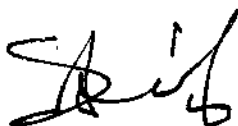**Name of the academic or professional program:** Bachelor's in Computer Science

Name of final degree: Bachelor's in Computer Science

Study system: bologna track(First stage+ Second stage)

Description preparation date: 17/12/2024

Date of filling out the file: 21/3/2025

Signature:

Name of Department Head

Dr. Saif Mahmoud

Date: / /2025

The file is checked by

Signature:

Name of Scientific Assistant

Dr. kawthar Muhammad ali

Date: / / 2025

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Mohammed J.Jader

Date: / / 2025

Signature:

Approval of the Dean

Academic Program Description

1. Program Vision

The vision of the Bologna track Program in Computer Science aims to provide academic education characterized by high quality, global competitiveness, and innovation, while qualifying graduates to contribute to achieving digital transformation and building an advanced and sustainable technological future. The Department of Computer Science is one of the main departments in the Faculties of Science, as it includes a number of different scientific specializations, including: communications, computer networks, artificial intelligence, and cybersecurity. The Department of Computer Science is of great importance due to its influential role in providing the labor market with programmers and software developers, and therefore it has the highest priority in keeping pace with the latest developments in the field of information technology. The development of software has opened up broad horizons for the employment of information technology in all scientific and applied fields, as the use of information technology has increased the efficiency and accuracy of work in addition to reducing human effort by relying on computer software.

2. Program Mission

The mission of the Bologna track Programme of the Department of Computer Science is to prepare graduates with high technical and scientific skills, capable of innovation and solving advanced digital problems, with a commitment to applying European quality standards and promoting scientific research and international cooperation. Contributing to the development of the digital society by providing graduates capable of contributing to the digital transformation of society through their skills in software development, data analysis, and IT solutions, and also supporting students to be leaders in the digital knowledge society and contribute to building a sustainable future based on technology.

3. Program Objectives

The objectives of the Bologna track Program for the Department of Computer Science aim to provide students with the knowledge and skills necessary to excel in the fields of computer science and information technology. These objectives are based on developing

academic education, enhancing graduates' capabilities, and supporting scientific research. The Department of Computer Science at the College of Science for Girls aims to provide the labor market with what it needs of programmers and software and application developers in various applied levels, in addition to the constant endeavor to keep pace with scientific and technological developments that are reflected in increasing the skills of the department's graduates. In addition to contributing to the development of this important field of knowledge (computer science) by having its researchers present scientific research at international and local conferences, in addition to publishing scientific research in various international journals, as well as patents, workshops, seminars, and training courses that drive the wheel of progress in this field.

4. Programmatic Accreditation

Nothing

5. Other External Influences

Training courses for students to develop scientific skills in advanced technology and programs + field visits

6. Program Structure

Program Structure	Number of courses		Credit hours		Percentage	Reviews
Enterprise Requirements	The first stage,Course (1), according to the Bologna system	2	The first stage,Course (1), according to the Bologna system	4	%33	Basic

and College Requirements	The first stage,Course (2), according to the Bologna system	2	The first stage,Course (2), according to the Bologna system	4	%33	
	Second stage Course (1)	1	Second stage Course (1)	2	%10	
	Second stage Course (2)	0	Second stage Course (1)	0	-	
Total summation		0		0		
Department Requirements	The first stage,Course (1), according to the Bologna system	5	The first stage,Course (1), according to the Bologna system	12	%83.33	Basic
	The first stage,Course (2), according to the Bologna system	5	The first stage,Course (2), according to the Bologna system	12	%83.33	
	Second stage Course (1)	6	Second stage Course (1)	١٨	%90	
	Second stage Course (2)	6	Second stage Course (2)	١٨	%90	
Total summation		21		60		
Summer Training	1		-			Basic

7. Detailed Description of Courses.

This guide covers the courses offered by the Computer Science program for the Bachelor of Science degree. The program offers (48) courses with (6000) total student load hours and 240 total European units. The delivery of courses is based on the Bologna process.

Year/level	course code	Name of the course	Credit hours	
			Theoretical	Practical
The first stage, Course (1), according to the Bologna system	UOBAB06040101	Programming Fundamentals	٢	٢
	UOBAB06040102	Digital Logic	٢	٢
		foundation of discrete structure	2	-
	UOBAB06040103	Computer Organization	٢	٢
		Linear algebra	2	-
		English language	2	-
The first stage, Course (2), according to the Bologna system	UOBAB06040201	Structured programming	٢	2
	UOBAB06040202	Computer Skills	٢	2
		Communication Skills	2	-
		Structures Discrete	2	-
		Probability and Statistics	2	1
		Arabic Language	2	-

Second stage Course (1)	C8	Object Oriented Programming (1)	2	2
	C11	Computation Theory (1)	3	-
	C16	Database (1)	2	2
	E57	Linux Fundamentals	2	2
	E55	Microprocessor and Assembly Languages	2	2
	C9	Data Structures	2	2
	S4	English Language (2)	2	-
Second stage Course (2)	E1	Object Oriented Programming (2)	٢	٢
	C12	Computation Theory (2)	3	-
	C17	Database (2)	٢	٢
	C4	Computer Architecture	3	-
	E45	Web Design & Programming	2	٢
	E4	Operational Researches	3	-
	C27	Probability and Statistics	3	-

8. The expected learning outcomes of the program

Knowledge

Knowledge and Understanding	1. The student learns about the nature of computer science. 2. The student learns about preparing scientific research in the field of computers. 3. The student is able to use computers in most applications. 4. The student is able to analyze and solve problems that may occur in the field of computer science. 5. The ability to find scientific solutions to community problems programmatically. 6. The ability to analyze and evaluate software systems before starting to design the system 7. Providing the student with some basic rules in evaluating and building software systems based on the basics of Software Engineering
Skills	
Subject-Specific Skills	B1 Theoretical - B2 Practical - B3 Summer Training - B4 Graduation Research
Thinking Skills	1. Let's Think about Thinking Ability: The goal of this skill is for the student to believe in what is tangible (student's abilities) and understand when, what and how he should think and work on improving the ability to think reasonably.

	2. High Thinking Skill: The goal of this skill is to teach thinking well before making a decision that determines the student's life, for example if the student wants to make a good decision, it is important to think well before making the decision and if he decides without thinking or if he cannot think well or if he cannot decide or perhaps will not decide, this means he does not have a high thinking skill 3. Critical Thinking Strategy in Learning (Critical Thanking): It is a term that symbolizes the highest levels of thinking that aims to pose a problem and then analyze it logically to reach the required solution. 4. Brainstorming
Evaluation methods	1-Through the regular exam (paper). 2-Through writing computer programs (practical application). 3-Through the method of expression with faces. 4-Preparing reports by students. 5-Relying on scheduled and unscheduled hours. By conducting the exam on the Moodle system using the E-learning technology

9. Teaching and Learning Strategies

Learning strategies

1- Thinking strategy according to the student's ability (example: if the student can learn the correct management concept, he will acquire the skill of managing and organizing his personal life).

2- High thinking skill strategy (example: if the student wants to make a good decision, it is important to think well before making the decision, and if he decides without thinking or if he cannot think well or if he cannot decide or perhaps will not decide, this means he does not have a high thinking skill).

3- Critical thinking strategy in learning (Critical Thanking) (is a term that symbolizes the highest levels of thinking that aims to pose a problem and then analyze it logically to reach the required solution).

4- Brainstorming.

Methods of teaching and learning

1-Method of delivering lectures.

2-Student Center

3-(Student groups Team Project)

4-(Work shop workshops)

5-(Scientific trips to follow up on the environmental reality)

6-(Learning Technologies on Campus)

7-(experiential learning)

8-(Application Learning)

10. Evaluation methods
The assessment methods in the Bologna Pathway programme rely on a combination of different assessment methods that aim to measure students' performance and their deep understanding of scientific and applied concepts, in addition to their practical skills and their ability to innovate and solve problems. These methods include:

1- Exams

2-Matrix (Learning Matrix)

3-Which Face (Method of Expression by Faces)

4-CAT (Feedback from Students)

5-Learning Triangle (Learning Triangle)

6-Preparing reports.

7-Relying on scheduled and unscheduled hours.

8- Additional duties inside and outside the college.

11. Faculty

Faculty Members

Academic Rank	Instructor's name	Specialization General	Specialization Special	Required qualifications if applicable	Rank of the teaching staff	
Professor	Dr. Hussein Attia Lafta	Computer	Artificial Intelligence		√	
Professor	Dr. Suhad Ahmed Ali	Computer	Artificial Intelligence		√	
Professor	Dr. Majid Jabbar Jawad	computer	security and information processing		√	
Professor	Dr . Samaher Hussein Ali	Computer	Artificial Intelligence		√	
Professor	Dr. Samah Abdel Hadi Abbas,	Mathematics	Mathematics		√	

Professor	Dr Muhammad Abdullah Nasser	Computer	security and information processing		√	
Professor	Dr. Sahar Adel Kazem	Computer	Security and information		√	
Professor	Dr. Israa Hadi Obaid,	Computer	Translators and Computational Theory		√	
Assistant Professor	Dr. Saif Mahmoud,	Computer	computer networks		√	
Professor	Dr. Mahdi Abdel Salman	Computer	Distributed Systems		√	
Professor	Dr. Muhammad Obaid	Computer	Information Technology/Soft ware		√	
Assistant	Dr. Salah Mahdi Saleh	Computer	Timbers Patterns		√	
Professor	Dr. Ahmed Badri Muslim,	Computer	Parallel Algorithms		√	
Assistant Professor	Dr.Ali Yaqoub Youssef	Computer	artificial intelligence		√	
Assistant Professor	Dr. Ali Kazem Muhammad	Computer	Information Technology/Soft ware		√	
Teacher	Dr . Farah Muhammad Hassan,	Computer	information security		√	
Teacher	Dr. wed Kazem Aliwi	Computer	Computer		√	
Assistant Professor	Dr. Ahmed Mohamed ‹Hussein	Computer	Computer		√	
Assistant Professor	Dr.. Zainab Abdel Moneim Abdel Hadi,	Mathematics	Functional Approximation Theory		√	

					√	
Teacher	Zainab Falah Hassan	Computer	Computer		√	
Assistant Professor	Dr. Elaf Ali Abboud	Computer	Computer		√	
Teacher	Noor Kazem Ayoub	Computer	Computer		√	
Assistant Professor	Asraa Abdullah Hussein	Computer	Computer		√	
Teacher	Russell Muhammad Nimah	Computer	Computer		√	
Teacher	Dr. Hossam Jawad Kazem,	Computer	communications systems		√	
assistant teacher	Nada Fadel Muhammad	Computer	Computer		√	
assistant teacher	Ishraq Abdel Amir Yahya	Computer	Computer		√	
teacher	Hadeel Qasim Ghani	Computer	Computer		√	
teacher	Zahraa Jabbar Hussein	Computer	Computer		√	
assistant teacher	Zahraa Abdel Mohamed	Computer	Computer		√	
assistant teacher	Jinan Ali Abd	Computer	Computer		√	
assistant teacher	Shaima Abdel Kazem Hadi	Computer	Computer		√	
assistant teacher	Zahraa Aboud Ahmed	Computer	Computer		√	
assistant teacher	Rafif Mazhar Katran	Computer	Computer		√	

Teaching, like any other art, can be acquired through practicing and following its methods and principles, provided that there is a sincere desire to practice the teaching profession. The method in education means taking interconnected steps to reach a specific goal that is hoped to be achieved. Therefore, the basic principles of good teaching must be followed, which are:

1- Guiding and directing learners by creating educational situations that lead to desired activities.

2- Providing an atmosphere of love, affection and cooperation between the teacher and learners and between the learners themselves through his love for his students without discrimination and not overdoing feminization.

3- Adopting democratic leadership through the sensory relationship between the teacher and his students, which leads them to control based on mutual respect and creating a cooperative atmosphere between the students and between the teacher and his students.

1- Thinking strategy according to the student's ability (example: if the student can learn the correct concept of management, he will acquire the skill of managing and organizing his personal life). And the strategy of high thinking skill (example: if the student wants to make a good decision, it is important to think well before making the decision and if he decides without thinking or if he cannot think well or if he cannot decide or perhaps will not decide, this means he does not have high thinking skill).

2- General and transferable skills (other skills related to employability and personal development).

3- Verbal communication.

4- Teamwork.

5- Analysis and investigation (collecting information systematically and scientifically to establish facts and principles to solve the problem). Initiative (motivation to work and the ability to take initiative, identify opportunities and put forward ideas and solutions.

Acceptance criterion

Central acceptance and parallel acceptance

12. The most important sources of information about the program

1- The website of the college and university.

https://csg.uobabylon.edu.iq/
https://csg.uobabylon.edu.iq/department/?cdid=4

https://csg.uobabylon.edu.iq/department/dep_lectures.aspx?cdid=4

2- The electronic system of the Bologna Process.

3-University guide .https://systems.uobabylon.edu.iq /

4-The most important books and resources in the college library.

13. Program development plan

The Bologna process was applied to first-year students and work is underway to apply it to future stages, with workshops and seminars being held to familiarize faculty members with the requirements of the Bologna process and how to work with it, discuss the negatives and obstacles, and find solutions for them. The electronic system was applied in the education process.

Required program learning outcomes

Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			Other skills related to employability and personal development		
				A	A1	A2	B1	B2	B3	B4	C1	C2	C3	D1	D2	D3	D4
The first stage. Course (1), according to the Bologna system	UOBAB06N40101	Programming Fundamentals																
	UOBAB06N40102	Digital Logic																
		foundation of discrete structure																
	UOBAB06N40103	Computer Organization	B															
		Linear algebra																
		English language	B															

Year/Level	Course Code	Course Name	Basic or Optional	Knowledge				Skills				Ethics				Other skills related to employability and personal development			
				A_1	A_2	A_7	A_{18}	B_1	B_2	B_3	B_4	C_1	C_2	C_3	C_4	D_1	D_2	D_3	D_4
The first stage, Course (2)s according to the Bologna system	UOBA0060040201	Structured programming																		
	UOBA00060040202	Computer Skills																		
		Communication Skills	B																	
		Discrete Structures	S																	
		Probability and Statistics	S																	
		Arabic Language	B																	

Program skills Outline

Required program learning outcomes

Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics				Other skills related to employability and personal development			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
Second stage Course (1)	C8	Object Oriented Programming (1)	Core																
	C11	Computation Theory (1)	Core																
	C16	Database (1)	Core																
	E57	Linux Fundamentals	Elective																
	E55	Microprocessor and Assembly Languages	Elective																
	C9	Data Structures	Core																
	S6	English Language (2)	Supported																

Year /Levels	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			Other skills related to employability and personal development			
				A_1	A_2	A_3	A_4	B_1	B_2	B_3	B_4	C_1	C_2	C_3	D_1	D_2	D_3	D_4
Second stage Course (2)	C1	Object Oriented Programming (2)	Core															
	C12	Computation Theory (2)	Core															
	C13	Database (2)	Core															
	C6	Computer Architecture	Core															
	E45	Web Design & Programming	Elective															
	E4	Operational Researches	Elective															
	C27	Probability and Statistics	Core															

وزارة التعليم العالي والبـحث العلمي

جـهاز الإشــراف والتقـويم العلمي

دائرة ضمان الجودة والاعتماد الأكاديمي

قسم الاعتماد الدولي
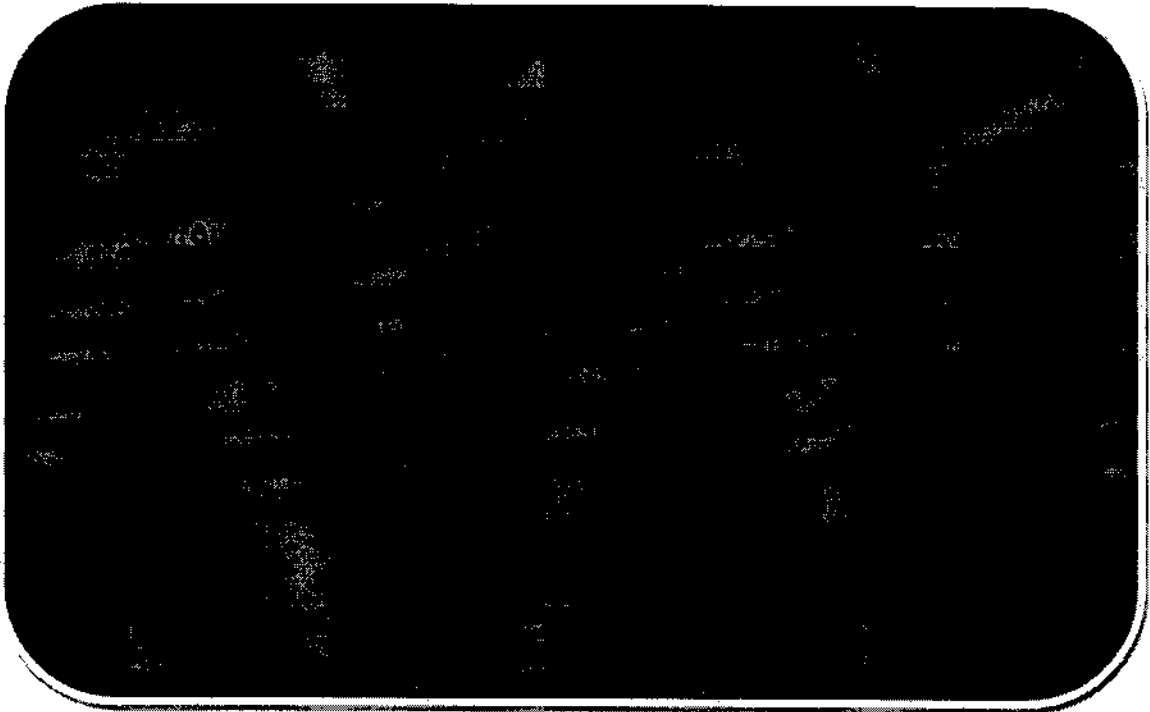
نموذج وصف البرنامج الاكاديمي

اسم الجامعة   : جامعة بابل

الكلية/ المعهد: كلية العلوم للبنات

اسم البرنامج الأكاديمي او المهني : بكالوريوس علوم حاسوب

اسم الشهادة النهائية : بكالوريوس في علوم حاسوب

النظام الدراسي : مسار بولونيا(المرحلة الاولى + المرحلة الثانية)

تاريخ اعداد الوصف : 17/12/2024

تاريخ ملء الملف : ٢١ / ٣ /٢٠٢٥

التوقيع:

التوقيع:

اسم المعاون العلمي: أ. د. كوثر محمد علي

اسم رئيس قسم: أ.م.د. سيف محمود خلف

التاريخ   /   / ٢٠٢٥

التاريخ   /   / ٢٠٢٥

دقق الملف من قبل

شعبة ضمان الجودة والأداء الجامعي

اسم مدير شعبة ضمان الجودة والأداء الجامعي : م. د. محمد جواد جادر

التاريخ   /   / ٢٠٢٥

مصادقة السيد العميد

نموذج وصف البرنامج الأكاديمي

١. رؤية البرنامج

يعد قسم علوم الحاسوب هو احد الاقسام الرئيسية في كليات العلوم حيث انه يضم عددا من التخصصات العلمية المختلفة التي نذكر منها: الاتصالات وشبكات الحاسوب والذكاء الاصطناعي والامن السيبراني و يتمتع قسم علوم الحاسوب باهمية كبرى لما له من دور مؤثر في تزويد سوق العمل بمبرمجين ومطوري البرامجيات ولذلك له الاولوية العليا في مواكبة آخر التطورات في مجال تكنولوجيا المعلومات. ان تطور البرامجيات فتح آفاقاً واسعة لتوظيف تكنولوجيا المعلومات في جميع المجالات العلمية والتطبيقية حيث ان استخدام تكنولوجيا المعلومات زاد من كفاءة ودقة العمل اضافة الى تقليل الجهد البشري بالاعتماد على برامجيات الحاسوب..

٢. رسالة البرنامج

رسالة البرنامج تتلخص بتقديم جيل من الخريجين الى المجتمع يتمتعون بامكانيات وخبرات علمية تمكنهم من الاسهام في بناء وتطوير سوق عمل قائم على استخدام افضل واحدث التقنيات العلمية والتكنولوجية الحديثة بما يخدم المجتمع. رؤية قسم علوم الحاسوب في كلية العلوم البنات تقوم على ان المجتمع وسوق العمل يجب ان يواكبا التطور التكنولوجي المتسارع في كافة انحاء العالم من خلال رفدهما بكوادر لها القدرة على بناء وتطوير البرامجيات المختلفة التي تساهم في توظيف التكنولوجيا الحديثة لتطوير مختلف مفاصل الحياة وحقول المعرفة.

٣. اهداف البرنامج

يهدف قسم علوم الحاسوب في كلية العلوم للبنات الى رفد سوق العمل بما يتناسب وحاجته من مبرمجين ومطوري البرامجيات والتطبيقات في مختلف الاصعدة التطبيقية اضافة الى السعي الدائم لمواكبة التطور العلمي والتكنولوجي الذي ينعكس في زيادة المهارات لدى خريجي القسم. اضافة الى الاسهام في تطوير هذا الحقل المعرفي (علوم الحاسوب) المهم من خلال القاء باحثيه بحوثا علمية في مؤتمرات عالمية ومحلية اضافة الى نشر بحوث علمية في مجلات دولية مختلفة فضلا عن براءات الاختراع والورش والندوات والدورات التدريبية التي هي تدفع بعجلة التقدم في هذا المجال.

٤. الاعتماد البرامجي

٥. المؤثرات الخارجية الاخرى

دورات تدريبية للطلبة لتطوير المهارات العلمية في التكنولوجيا المتقدمة والبرامج +زيارات ميدانية

٦. هيكلية البرنامج

				رمز المقرر او المساق	اسم المقرر او المساق
متطلبات المؤسسة و	اساسي	33%	٤	المرحلة الأولى (1) *Course* حسب نظام بولونيا	٢	المرحلة الأولى (1) *Course* حسب نظام بولونيا
		33%	٤	المرحلة الأولى (2) *Course* حسب نظام بولونيا	٢	المرحلة الأولى (2) *Course* حسب نظام بولونيا

					متطلبات الكلية
%14.28	٢	المرحلة الثانية(2) *Course*	١	المرحلة الثانية(1) *Course*	
	-	المرحلة الثانية(2) *Course*	٠	المرحلة الثانية(2) *Course*	
	١٠		٥		المجموع الكلي
%83.33	١٢	المرحلة الأولى 1 *Course* حسب نظام بولونيا	٥	المرحلة الأولى (1) *Course* حسب نظام بولونيا	متطلبات القسم
%83.33	١٢	المرحلة الأولى (2) *Course* حسب نظام بولونيا	٥	المرحلة الأولى (2) *Course* حسب نظام بولونيا	
%٨٥.٧	١٨	المرحلة الثانية(1) *Course*	٦	المرحلة الثانية(1) *Course*	
%٨٥.٧	١٨	المرحلة الثانية(2) *Course*	٦	المرحلة الثانية(2) *Course*	

المجموع الكلي		٦٠		٢٢	
التدريب الصيفي	/			١	

الوصف التفصيلي للمواد الدراسية

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج علوم الحاسبات للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (48) مادة دراسية مع (٦٠٠٠) إجمالي ساعات حمل الطالب و ٢٤٠ إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

First Semester

No.	Module Code	Module Name in English	Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type
1	UOBAB06040101	Programming Fundamentals	4	79	69	150	6.00	C
2	UOBAB06040102	Digital Logic	4	64	88	150	6.00	S
3		foundation of discrete structure	2	32	68	100	4.00	S
4	UOBAB06040103	Computer Organization	4	64	86	150	6.00	B
5		Linear algebra	2	32	68	100	4.00	S

Second Semester

	Module Code	Module Name in English	Cr hr/sem	SSWL hr/sem	USWL hr/sem	Total	Percentage	Module type
1	UOBAB 060402 01	Structured programming	4	79	121	200	8.00	C
2	UOBAB 060402 02	Computer Skills	4	64	86	150	6.00	S
3		Communication Skills	2	32	68	100	4.00	B
4		Structures Discrete	2	32	68	100	4.00	S
5		Probability and Statistics	2	32	68	100	4.00	S
6		Arabic Language	2	32	68	100	4.00	B

Second Year (2024-2025) First Semester (41 units)

#	Course Name	اسم المادة باللغة العربية	Course semester Code	Units	Theoretical	tuto	pra	Course units	Course type
1	Object Oriented Programming (1)	برمجة كيانية التوجه (١)	C8	3	2	2	1	5	Core
2	Computation Theory (1)	نظرية احتسابية (١)	C11	3	3	-	-	3	Core
3	Database (1)	قواعد بيانات(1)	C16	3	2	2	-	4	Core
4	Linux Fundamentals	أساسيات لينكس	E57	3	2	2	-	4	Elective
5	Microprocessor and Assembly Languages	معالجات دقيقة ولغة تجميع	E55	3	2	2	-	4	Elective
6	Data Structures	هياكل البيانات	C9	3	2	2	-	4	Core
7	English Language (2)	لغة انكليزية (٢)	S4	2	2	-	-	2	Supported
	Total			20	15	10	1	26	

Second Semester

Object Oriented Programming (2)	برمجة كائنية التوجه (2)	E1	3	2	2	1	5	Core
Computation Theory (2)	نظرية الحسابية (2)	C12	3	3	.	.	3	Core
Database (2)	قواعد بيانات (2)	C17	3	2	2	.	4	Core
Computer Architecture	معمارية الحاسوب	C4	3	3	.	.	3	Core
Web Design & Programming	تصميم وبرمجة المواقع	E45	3	2	2	.	4	Elective
Operational Researches	بحوث العمليات	E4	3	3	.	1	4	Elective
Probability and Statistics	احصاء واحتمالية	C27	3	3	.	.	3	Core
			21	18	6	2	26	

٨ مخرجات التعلم المتوقعة للبرنامج

المعرفة والفهم	١. يتعرف الطالب على طبيعة علوم الحاسبات. ٢. يتعرف الطالب على اعداد البحث العلمي في مجال الحاسبات. ٣. يتمكن الطالب من استخدام الحاسبات في اغلب التطبيقات. ٤. يتمكن الطالب من تحليل المشاكل التي قد تحدث في مجال علوم الحاسبات وحلها. ٥. القدرة على إيجاد الحلول العلمية لمشاكل المجتمع برمجيا. ٦. القدرة على تحليل الأنظمة البرمجية وتقيمها قبل البدء بتصميم النظام ٧. تزويد الطالب ببعض القواعد الأساسية في تقيم وبناء الانظمة البرمجية بالاعتماد على اساسيات هندسة البرمجيات
المهارات الخاصة بالموضوع	ب ١ نظري - ب ٢ عملي - ب ٣ تدريب صيفي - ب ٤ بحوث تخرج
مهارات التفكير	١. سهارة التفكير حسب قدرة الطالب (Let's Think about Thinking Ability): الهدف من هذه المهارة هو أن يعتقد الطالب بما هو ملموس (قدرات الطالب) وفهم متى وماذا وكيف يجب أن يفكر ويعمل

	على تحسين القدرة على التفكير بشكل معقول.
	٢. مهارة التفكير العالية: الهدف من هذه المهارة هو تعليم التفكير جيدا قبل يتخذ القرار الذي يحدد حياة الطالب، مثال إذا كان الطالب يرغب في اتخاذ قرار جيد، من المهم أن يفكر جيدا قبل أن يتخذ القرار وإذا قرر دون تفكير أو إذا كان لا يستطيع التفكير جيدا أو إذا كان لا يستطيع أن يقرر أو ربما لن يقرر فهذا يعني ليس لديه مهارة التفكير العالية.
	٣. استراتيجية التفكير الناقد في التعلم (Critical Thanking): هي مصطلح يرمز لأعلى مستويات التفكير والتي يهدف إلى طرح مشكلة ما ثم تحليلها منطقياً للوصول إلى الحل المطلوب.
	٤. العصف الذهني

طرائق التقييم	١- من خلال الامتحان الاعتيادي (الورقي).
	٢- من خلال كتابة برامج حاسوبية (التطبيق العملي).
	٣- من خلال طريقة التعبير بالوجوه.
	٤- عمل تقارير من قبل الطلبة.
	٥- الاعتماد على الساعات المجدولة والغير مجدولة.
	٦. الشاطات المراهني
	من خلال اجراء الامتحان على نظام المودل باستخدام تقنية التعلم عن طريق الأنترنت E-learning

٩. إستراتيجيات التعليم والتعلم

استراتيجيات التعلم

١-استراتيجية التفكير حسب قدرة الطالب (مثال : إذا استطاع الطالب أن يتعلم مفهوم الادارة الصحيح يكتسب مهارة أدارة وتنظيم حياته الشخصية) .

٢-استراتيجية مهارة التفكير العالية (مثال اذا كان الطالب يرغب في اتخاذ قرار جيد، من المهم أن يفكر جيدا قبل أن يتخذ القرار و إذا قرر دون تفكير أو إذا كان لا يستطيع التفكير جيدا أو إذا كان لا يستطيع أن يقرر أو ربما لن يقرر فهذا يعني ليس لديه مهارة التفكير العالية).

٣-استراتيجية التفكير الناقد في التعلم (Critical Thanking) (هي مصطلح يرمز لأعلى مستويات التفكير والتي يهدف إلى طرح مشكلة ما ثم تحليلها منطقياً للوصول إلى الحل المطلوب).

٤ ـالعصف الذهني.

١-طريقة القاء المحاضرات .

٢- Student Center

٣-(المجاميع الطلابية Team Project)

٤ - (Work shop ورش العمل)

٥- (الرحلات العلمية لمتابعة الواقع البيئي)

٦- (التعلم الالكتروني داخل الحرم الجامعي Learning Technologies on Campus)

٧-(التعلم التجريبي experiential learning)

8 - (Application Learning تطبيق التعليم)

١٠. طرائـــــــق التقييم

١- Exams

٢- Matrix(مصفوفة التعلم)

٣- Which Face(طريقة التعبير بالوجوه)

٤ - CAT (التغذية الراجعة من الطلاب)

٥- Learning Triangle(مثلث التعلم)

٦- عمل تقارير.

٧- الاعتماد على الساعات المجدولة والغير مجدولة.

٨- واجبات اضافية داخل الكلية وخارج الكلية.

١١. الهيئة التدريسية

اعضاء هيئة التدريس

				الخدمة		
	√		ذكاء اصطناعي	حاسوب	ا.د حسين عطية لفتة	استاذ
	√		ذكاء اصطناعي	حاسوب	ا.د. سهد احمد علي	استاذ
	√		امنية و معالجة معلومات	حاسوب	ا.د. ماجد جبار جواد	استاذ
	√		ذكاء اصطناعي	حاسوب	ا.د . ساهر حسين علي	استاذ
	√		رياضيات	حاسوب	ا. سماح عبد الهادي عباس	استاذ
	√		امنية و معالجة معلومات	حاسوب	ا.د. محمد عبد الله ناصر	استاذ
	√		امنية معلومات	حاسوب	ا.م. د . سحر عادل كاظم	استاذ
	√		المترجمات والنظرية الاحتسابية	حاسوب	ا.م.د. اسراء هادي عبيد	استاذ
	√		شبكات الحاسوب	حاسوب	ا.م.د . سيف محمود خلف	استاذ مساعد
	√		انظمة موزعه	حاسوب	ا.م.د. مهدي عبد سلمان	استاذ
	√		تمييز انماط	حاسوب	م. صلاح مهدي صالح	مدرس

	√		تكنولوجيا معلومات /برامجيات	حاسوب	ا.م.د. محمد عبيد مهدي	استاذ
	√		خوارزميات متوازية	حاسوب	ا.م.د . احمد بدري مسلم	استاذ
	√		ذكاء اصطناعي	حاسوب	ا.م.د. علي يعكوب يوسف	استاذ مساعد
	√		تكنولوجيا معلومات /برامجيات	حاسوب	أ.م.د. علي كاظم محمد	استاذ مساعد
	√		امنية معلومات	حاسوب	م.د . فرح محمد حسن	مدرس
	√		حاسوب	حاسوب	د.م. ود كاظم طبوي	مدرس
	√		حاسوب	حاسوب	د.م. احمد محمد حسين	استاذ مساعد
	√		نظرية التقريب الدالي	حاسوب	أ.م. زينب عبد المنعم عبد الهادي	استاذ مساعد
	√		حاسوب	حاسوب	م. زينب فلاح حسن	مدرس
	√		حاسوب	حاسوب	د.أ.م.ايلاف علي عبود	استاذ مساعد
	√		حاسوب	حاسوب	م. نور كاظم ايوب	مدرس
	√		حاسوب	حاسوب	م. اسراء عبد الله حسين	استاذ مساعد
	√		حاسوب	حاسوب	م. رسل محمد نعمة	مدرس
	√		حاسوب	حاسوب	م.م . ندى فاضل محمد	مدرس مساعد
	√		حاسوب	حاسوب	م.م اشراق عبد الامير يحيى	مدرس مساعد

	√		حاسوب	حاسوب	م. هديل قاسم غني	مدرس
	√		حاسوب	حاسوب	م. زهراء جبار حسين	مدرس
	√		حاسوب	حاسوب	م.م. زهراء عبد محمد	مدرس مساعد
	√		حاسوب	حاسوب	م.م. جنان علي عبد	مدرس مساعد
	√		حاسوب	حاسوب	م. م. شيماء عبد الكاظم هادي	مدرس مساعد
	√		حاسوب	حاسوب	م. زهراء عبود احمد	مدرس مساعد
	√		حاسوب	حاسوب	م. م. رفيف مظهر كطران	مدرس مساعد

التطويـــــــــر المهني

التدريس كأي فن اخر يمكن اكتسابه من خلال ممارسة وأتباع طرقه وأصوله بشرط الرغبة الصادقة مزاولة مهنة التدريس في التربية تعني اتخاذ خطوات مترابطة للوصول الى هدف معين ترجى تحقيقه. لذلك يجب ان يتبع المبادئ الاساسية في التدريس الجيد والتي هي:

١- توجيه المتعلمين وارشادهم عن طريق خلق مواقف تعليمية تؤدي إلى فعاليات مرغوبة فيها.

٢- توفير جو من المحبة والعطف والتعاون بين المعلم والمتعلمين وبين المتعلمين أنفسهم من خلال حبه لطلبته تمييز وعدم الأكثار من التأنيث.

٣- اعتماد القيادة الديمقراطية من خلال العلاقة الحسية بين المدرس وطلبته مما يقودهم الى

الضبط المبني على الاحترام المتبادل وخلق جو تعاوني بين الطلبة وبين المدرس وطلبته.

██████████████████████████████████████

١ـ استراتيجية التفكير حسب قدرة الطالب (مثال : أذا استطاع الطالب أن يتعلم مفهوم الادارة الصحيح يكتسب مهارة أدارة وتنظيم حياته الشخصية) . و استراتيجية مهارة التفكير العالية (مثال اذا كان الطالب يرغب في اتخاذ قرار جيد، من المهم أن يفكر جيدا قبل أن يتخذ القرار و إذا قرر دون تفكير أو إذا كان لا يستطيع التفكير جيدا أو إذا كان لا يستطيع أن يقرر أو ربما لن يقرر فهذا يعني ليس لديه مهارة التفكير العالية).

٢ـ المهارات العامة والمنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي).

٣ـ   التواصل اللفظي .

٤ـ   العمل الجماعي.

٥ـ   تحليل والتحقيق (جمع المعلومات بشكل منهجي وعلمي لتأسيس الحقائق والمبادئ حل المشكلة).

٦ـ   مبادرة (الدافعية على العمل والقدرة على المبادرة، وتحديد الفرص و وضع الأفكار والحلول المطروحة.

---

١٢ ـ معيـــــــار القبول

قبول مركزي وقبول موازي

---

١٣ ـ اهـــــــم مصادر المعلومات عن البرنامج

١ـ الموقع الالكتروني للكلية والجامعة.

https://csg.uobabylon.edu.iq/

https://csg.uobabylon.edu.iq/department/?cdid=4

https://csg.uobabylon.edu.iq/department/dep_lectures.aspx?cdid=4

٢ـ النظام الالكتروني الخاص بمسار بولونيا.

٣ـ دليل الجامعة . https://systems.uobabylon.edu.iq/

٤ـ أهم الكتب والمصادر الخاصة بمكتبة الكلية.

١٤. خطـــــــــة تطوير البرنامج

تم تطبيق مسار بولونيا على طلبة المرحلة الاولى والعمل على تطبيقه على المراحل القادمة مع عمل ورش عمل وسمنارات لتعريف اعضاء الهيئة التدريسية على متطلبات مسار بولونيا وكيفية العمل به ومناقشة السلبيات والمعوقات وايجاد الحلول لها. تم تطبيق النظام الالكتروني في عملية التعليم .
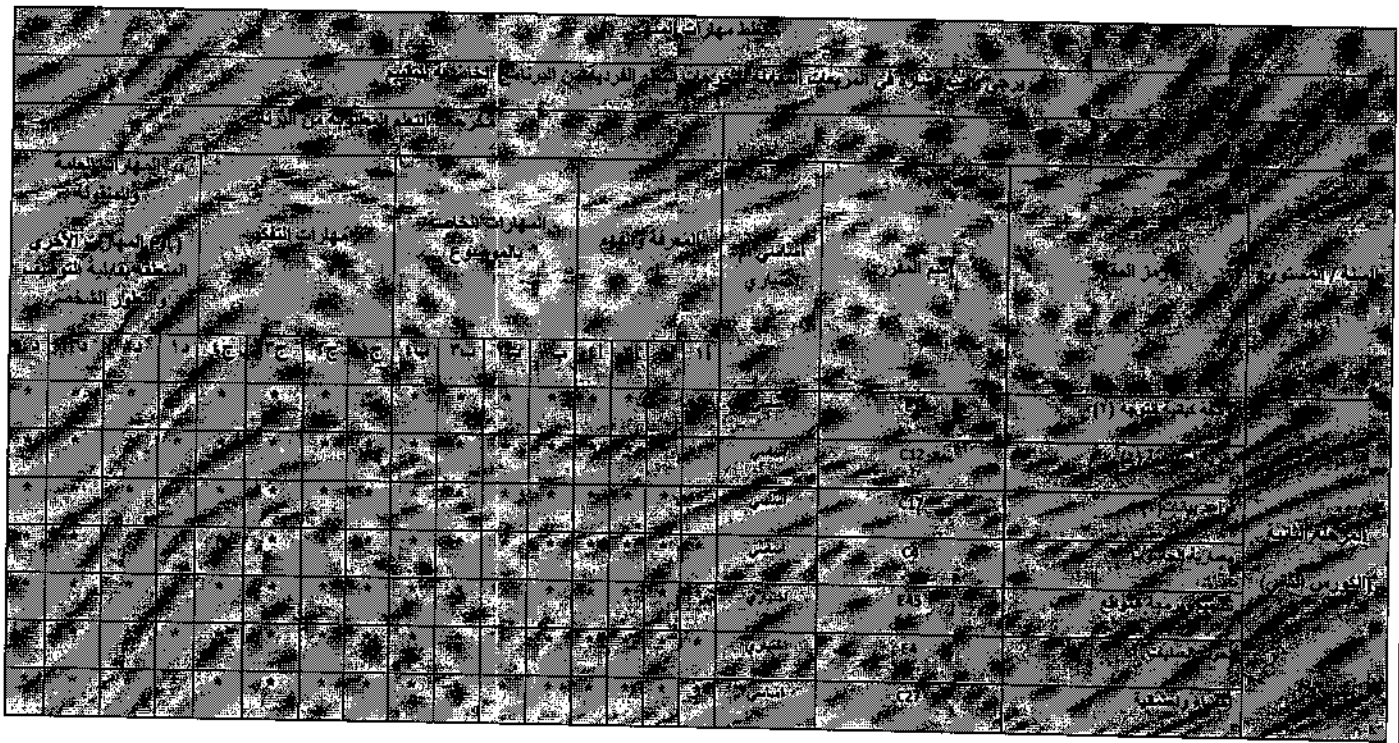
													Structured programming			COM121??
												S	Computer Skills			UOBAB06040202
												B	Communication Skills			
												S	Structures Discrete			
												S	Probability and Statistics			
												B	Arabic Language			

<table>
<tr><td></td><td>Ministry of Higher Education and
Scientific Research - Iraq
University of Babylon
College of Science for Women
Computer Science</td><td></td></tr>
</table>

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			

Module Title	Linux Fundamentals		Module Delivery	
Module Type	BASIC		Theory Lecture Seminar	
Module Code	COM23010			
ECTS Credits	5			
SWL (hr/sem)				

Module Level	2	Semester of Delivery	1
Administering Department	Computer Science	College	College of Science for Women
Module Leader	Ahmed Badri Muslim	e-mail	ahmed.fanfakh@uobabylon.edu.iq
Module Leader's Acad. Title	Prof.	Module Leader's Qualification	PhD
Module Tutor	None	e-mail	None
Peer Reviewer Name		e-mail	
Review Committee Approval		Version Number	

<table>
<tr><td colspan="3" align="center">**Relation With Other Modules**
العلاقة مع المواد الدراسية الأخرى</td></tr>
<tr><td>**Prerequisite module**</td><td>None</td><td>**Semester**</td><td></td></tr>
<tr><td>**Co-requisites module**</td><td>None</td><td>**Semester**</td><td></td></tr>
</table>

<table>
<tr><td colspan="2" align="center">**Module Aims, Learning Outcomes and Indicative Contents**
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية</td></tr>
<tr><td>**Module Aims**
أهداف المادة الدراسية</td><td align="right">1- التعرف على بنية نظام التشغيل والهيكلة الخاصة به.
2- مقارنة نظام التشغيل لنكس مع الانظمة الاخرى.
3- فهم مميزات النظام واسباب اهميته للمبرمجين.
4- التعرف على مبادئ النظام المفتوح المصدر .
5- دراسة ايعازات النظام عن طريق الامثلة الخاصة بادارة البيانات.
6- دراسة طرق ربط ايعازات النظام مع لغة البرمجة لتوليد برامج لها قابلية اكبر من الايعازات الموجودة بالنظام لادراة الملفات والبيانات كحزمة واحدة.</td></tr>
<tr><td>**Module Learning Outcomes**

مخرجات التعلم للمادة الدراسية</td><td align="right">1. فهم طريقة عمل النظام والتعامل مع ايعازاته.
2. يستطيع الطالب ان يفهم نظام التشغيل المفتوح المصدر.
3. التعرف على ادوات النظام التي تعمل كوسيلة ممتازة لتظيم الملفات بطرق عدة.
4. التعرف على طرق تنصيب وازالة البرامج الخدمية من والى النظام .
5. تعلم طرق برمجة انظمة التشفيل عن طريق لغات البرمجة مثل لغة Linux Batch script</td></tr>
<tr><td>**Indicative Contents**
المحتويات الإرشادية</td><td></td></tr>
</table>

<table>
<tr><td colspan="2" align="center">**Learning and Teaching Strategies**
استراتيجيات التعلم والتعليم</td></tr>
<tr><td>**Strategies**</td><td align="right">طرائق التعليم والتعلم
1. استخدام الشاشات الذكية بالاضافة الى السبورات العادية
2. عرض المحاضرة بموقع الجامعة وكذلك في موقع الكلية والقسم
3. التركيز على الحلقات النقاشية بين الاستاذ والطالبات
4. تشجيع التعلم الذاتي ومساعدة الطالبات على الاستنتاج
5. التاكيد على المنافسة بين الطالبات</td></tr>
</table>

<table>
<tr><td colspan="4" align="center">**Student Workload (SWL)**
الحمل الدراسي للطالب</td></tr>
<tr><td>**Structured SWL (h/sem)**
الحمل الدراسي المنتظم للطالب خلال الفصل</td><td>100</td><td>**Structured SWL (h/w)**
الحمل الدراسي المنتظم للطالب أسبوعيا</td><td>2</td></tr>
<tr><td>**Unstructured SWL (h/sem)**
الحمل الدراسي غير المنتظم للطالب خلال الفصل</td><td></td><td>**Unstructured SWL (h/w)**
الحمل الدراسي غير المنتظم للطالب أسبوعيا</td><td></td></tr>
<tr><td>**Total SWL (h/sem)**
الحمل الدراسي الكلي للطالب خلال الفصل</td><td>100</td><td></td><td></td></tr>
</table>

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

Week	Material Covered
Week 1	General definition of Linux
Week 2	General remarks on the operating system UNIX/Linux
Week 3	Linux history and distributions
Week 4	Components of Linux System and Architecture
Week 5	Linux command line Man pages
Week 6	Working with directories
Week 7	Working with directories
Week 8	Working with files: File command, touch command, remove file
Week 9	Working with files: copy files, copy to another directory, copy multiple files to directory, moving files
Week 10	Working with file contents: Head command, tail, cat, concatenate, create files with cat, copy files using cat, Tac, more and less commands
Week 11	Installing and uninstalling packages
Week 12	Command and arguments
Week 13	Linux filters
Week 14	Script programming: input, output primitives and control
Week 15	Script programing: loops and other useful Bach commands
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Working with Linux terminals
Week 2	Working with MAN pages of Linux
Week 3	Working with standard Linux command: Change Directory, Absolute and relative paths
Week 4	Path Completion, List Contents, Make directory, remove dir.
Week 5	Working with File command, touch command, remove file
Week 6	copy files, copy to another directory
Week 7	copy multiple files to directory, moving files
Week8	Head, tai and cat commands
Week9	Create files with cat, copy files using cat, Tac, more and less commands
Week10	Quiz
Week11	dpkg, APT, install and update the system software
Week 12	Control operators
Week13	Project
Week 14	Writing program in Bach script language
Week 15	Writing program that perform some operating system services

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Richard Petersen, **Linux: The Complete Reference**, Sixth Edition, 2008.	
Recommended Texts	Paul Cobbaut, **Linux Fundamentals**, Netsec BVBA, 2015.	
Websites	There are a lot of information over internets	

APPENDIX:

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

<table>
<tr><td></td><td>Ministry of Higher Education and
Scientific Research - Iraq
University of Babylon
College of Science for Women
Computer Science</td><td></td></tr>
</table>

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		

Module Title	Parallel computing	Module Delivery	
Module Type	ELECTIVE	Theory Lecture Seminar	
Module Code	COM36028		
ECTS Credits	5		
SWL (hr/sem)			

Module Level	3	Semester of Delivery	2
Administering Department	Computer Science	College	College of Science for Women
Module Leader	Ahmed Badri Muslim	e-mail	ahmed.fanfakh@uobabylon.edu.iq
Module Leader's Acad. Title	Prof.	Module Leader's Qualification	PhD
Module Tutor	None	e-mail	None
Peer Reviewer Name		e-mail	
Review Committee Approval		Version Number	

Relation With Other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

<table>
<tr><th colspan="2" align="center">Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية</th></tr>
<tr>
<td align="center">Module Aims
أهداف المادة الدراسية</td>
<td align="right">يهدف هذا المقرر لدراسة مستويات التوازي التي يمكن تطبيقها بالطرق المادية او البرمجية، إضافة الى التعرف على معمارية الأنظمة المتوازية ذات الذاكرة المشتركة وأنظمة الذاكرة الموزعة. بعد دراسة أنواع هذه الأنظمة سوف يتم دراسة بعض المقاييس لتقيم تسارع البرامج المنفذة بالتوازي. انتقالا الى الجانب البرمجي سيتعرف الطالب على أسلوب البرمجة المتوازية وتعلم كتابة البرامج المتوازية باستخدام لغة برمجة متخصصة للقيام بهذا الهدف.</td>
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<tr>
<td align="center">Module Learning Outcomes

مخرجات التعلم للمادة الدراسية</td>
<td align="right">أ1-دراسة مستويات التوازي التي يمكن تطبيقها بالطرق المادية او البرمجية.
أ2-دراسة معمارية الأنظمة المتوازية ذات الذاكرة المشتركة وأنظمة الذاكرة الموزعة.
أ3-تعلم بعض المقاييس لتقيم تسارع البرامج المنفذة بالتوازي.
أ4-فهم أسلوب البرمجة المتوازية
أ5-فهم تنظيم طرق الاتصال بين عناصر الاحتساب المتوازي.
أ6-تعلم لغة واجهة تمرير الرسائل لبرمجة بعض المشاكل التي تحل بالتوازي.</td>
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<tr>
<td align="center">Indicative Contents
المحتويات الإرشادية</td>
<td align="right">قراءات داخلية (المحاضرات) والحلقات النقاشية في المختبر.
توجيه الطلاب الى قراءات خارجية لمواكبة عبر المكتبات الافتراضية والانترنيت</td>
</tr>
<tr><th colspan="2" align="center">Learning and Teaching Strategies
استراتيجيات التعلم والتعليم</th></tr>
<tr>
<td align="center">Strategies</td>
<td align="right">طرائق التعليم والتعلم
1. استخدام الشاشات الذكية بالاضافة الى السبورات العادية
2. عرض المحاضرة بموقع الجامعة وكذلك في موقع الكلية والقسم
3. التركيز على الحلقات النقاشية بين الاستاذ والطالبات
4. تشجيع التعلم الذاتي ومساعدة الطالبات على الاستنتاج
التاكيد على المنافسة بين الطالبات</td>
</tr>
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<table>
<tr><th colspan="4" align="center">Student Workload (SWL)
الحمل الدراسي للطالب</th></tr>
<tr>
<td>Structured SWL (h/sem)
الحمل الدراسي المنتظم للطالب خلال الفصل</td>
<td>100</td>
<td>Structured SWL (h/w)
الحمل الدراسي المنتظم للطالب أسبوعيا</td>
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<tr>
<td>Unstructured SWL (h/sem)
الحمل الدراسي غير المنتظم للطالب خلال الفصل</td>
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<td>Unstructured SWL (h/w)
الحمل الدراسي غير المنتظم للطالب أسبوعيا</td>
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<tr>
<td>Total SWL (h/sem)
الحمل الدراسي الكلي للطالب خلال الفصل</td>
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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 to parallel computing
Week 2	Levels of Parallelism
Week 3	Flynn's Taxonomy
Week 4	Parallel Architectures
Week 5	Program Parallelism
Week 6	Classification of Communication Networks
Week 7	Direct Communication Networks
Week 8	Indirect Communication Networks
Week 9	Routing and Switching
Week 10	Parallel System Models
Week 11	Memory Hierarchy
Week 12	Parallel Programming
Week 13	MPI Language
Week 14	Writing Parallel Programs
Week 15	Evaluation of Program Speedup
Week 16	**Final Exam**

	Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر
	Material Covered
Week 1	Domain Decomposition: Block Decomposition
Week 2	Domain Decomposition: Cyclic Decomposition
Week 3	Functional Decomposition
Week 4	Message passing interface
Week 5	Point-to-point communication
Week 6	Writing program depends on point-to-point communication
Week 7	Writing program depends Domain Decomposition
Week8	Writing program depends cyclic Decomposition
Week9	Writing program depends functional Decomposition
Week10	Quiz
Week11	Collective communication
Week 12	Writing program using Collective communication
Week13	Projects
Week 14	Execution time measurements
Week 15	Quiz

	Learning and Teaching Resources مصادر التعلم والتدريس	
	Text	**Available in the Library?**
Required Texts	Thomas Rauber and Gudula Runger. Parallel programming: for multicore and cluster systems. Springer-Verlag, Berlin, 2010	
Recommended Texts	Introduction to Parallel Computing. *Blaise Barney, Lawrence Livermore National Laboratory,* https://computing.llnl.gov/tutorials/parallel_comp/	
Websites	There are a lot of information over internets	

APPENDIX:

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

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

Ministry of Higher Education and
Scientific Research - Iraq
University of Babylon
College of Science for Women
Computer Science

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Computer Organization	**Module Delivery**	
Module Type	CORE	Theory Lecture Seminar	
Module Code	UOBAB0604012		
ECTS Credits	8		
SWL (hr/sem)	200		
Module Level	1	**Semester of Delivery**	1
Administering Department	Computer Science	**College**	College of Science for Women
Module Leader	Ahmed Mohammed Hussein	**e-mail**	wsci.ahmed.mohammed@uobabylon.edu.iq
Module Leader's Acad. Title	Assist. Prof.	**Module Leader's Qualification**	PhD
Module Tutor	None	**e-mail**	None
Peer Reviewer Name		**e-mail**	
Review Committee Approval	2023-11-05	**Version Number**	

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<tr>
<td colspan="3" align="center">Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى</td>
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<tr>
<td>Prerequisite module</td>
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<td>Semester</td>
<td></td>
</tr>
<tr>
<td>Co-requisites module</td>
<td>None</td>
<td>Semester</td>
<td>1</td>
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<table>
<tr>
<td colspan="2" align="center">Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية</td>
</tr>
<tr>
<td>Module Aims
أهداف المادة الدراسية</td>
<td>تهدف هذه المادة على تطوير الفهم الاساسي لتنظيم وتشغيل جهاز الحاسوب المكتبي بما في ذلك معمارية وحدة المعالجة المركزية , الذاكرة و اجهزة الادخال والاخراج . الطالب سوف يكون قادرا على مناقشة مبادئ تمثيل المعلومات وقادرا على استخدام تمثيل اعداد متنوعة والتحويل بينهم. ايضا , سوف يكتسب الطالب فهم اساسي للخصائص المعمارية لأنظمة الحاسوب الحديثة , بما في ذلك مسارات النقل وتنظيم الذاكرة الحديثة . كما يوفر مقدمة لتنظيم وتشغيل برنامج نظام التشغيل .</td>
</tr>
<tr>
<td>Module Learning Outcomes

مخرجات التعلم للمادة الدراسية</td>
<td>1. اجزاء الحاسوب الاساسية واجيال الحاسوب.
2. تمثيل البيانات (اعداد واحرف). تمثيل البيانات.
3. اهم العمليات التي يقوم بتنفيذها الحاسوب مثل الجمع والطرح والضرب والقسمة.
4. تخزين البيانات وتوضيح اجهزة الخزن الرئيسية والثانوية.</td>
</tr>
<tr>
<td>Indicative Contents
المحتويات الإرشادية</td>
<td>1- قراءات' تعلم ذاتي، حلقات نقاش
2- التدريبات والانشطة في قاعة الدرس
3- ارشاد الطلاب الى بعض المصادر والموقع الالكترونية للاستفادة منها.</td>
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<tr>
<td colspan="2" align="center">Learning and Teaching Strategies
استراتيجيات التعلم والتعليم</td>
</tr>
<tr>
<td>Strategies</td>
<td>1- طريقة القاء المحاضرات.
2- Student Center.
3- (المجاميع الطلابية Team Project).
4- (Work shopورش العمل).
5- (Learning Technologies on Campus) (التعلم الالكتروني داخل الحرم الجامعي).
6- (experiential learning التعلم التجريبي) من خلال كتابة برامج حاسوب وتطبيقها ومعرفة مخرجاتها.</td>
</tr>
</table>

<table>
<tr>
<td colspan="4" align="center">Student Workload (SWL)
الحمل الدراسي للطالب</td>
</tr>
<tr>
<td>Structured SWL (h/sem)
الحمل الدراسي المنتظم للطالب خلال الفصل</td>
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<td>Structured SWL (h/w)
الحمل الدراسي المنتظم للطالب أسبوعيا</td>
<td>2</td>
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<tr>
<td>Unstructured SWL (h/sem)
الحمل الدراسي غير المنتظم للطالب خلال الفصل</td>
<td></td>
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الحمل الدراسي غير المنتظم للطالب أسبوعيا</td>
<td></td>
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<tr>
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الحمل الدراسي الكلي للطالب خلال الفصل</td>
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<tr><td colspan="6" align="center">**Module Evaluation**
تقييم المادة الدراسية</td></tr>
<tr><td></td><td></td><td>**Time/Number**</td><td>**Weight (Marks)**</td><td>**Week Due**</td><td>**Relevant Learning Outcome**</td></tr>
<tr><td rowspan="4">**Formative assessment**</td><td>**Quizzes**</td><td>2</td><td>10% (10)</td><td>5, 10</td><td>LO #1, 2, 10 and 11</td></tr>
<tr><td>**Assignments**</td><td>2</td><td>10% (10)</td><td>2, 12</td><td>LO # 3, 4, 6 and 7</td></tr>
<tr><td>**Projects / Lab.**</td><td>1</td><td>10% (10)</td><td>Continuous</td><td></td></tr>
<tr><td>**Report**</td><td>1</td><td>10% (10)</td><td>13</td><td>LO # 5, 8 and 10</td></tr>
<tr><td rowspan="2">**Summative assessment**</td><td>**Midterm Exam**</td><td>2 hr</td><td>10% (10)</td><td>7</td><td>LO # 1-7</td></tr>
<tr><td>**Final Exam**</td><td>2hr</td><td>50% (50)</td><td>16</td><td>All</td></tr>
<tr><td colspan="2">**Total assessment**</td><td></td><td>100% (100 Marks)</td><td></td><td></td></tr>
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<table>
<tr><td colspan="2" align="center">**Delivery Plan (Weekly Syllabus)**
المنهاج الاسبوعي النظري</td></tr>
<tr><td></td><td>**Material Covered**</td></tr>
<tr><td>**Week 1**</td><td>مقدمة عن تنظيم الحاسوب, اجيال الحاسوب , فئات الحاسوب.
Introduction to Computer Organization, Computer Generations and Computer Categories.</td></tr>
<tr><td>**Week 2**</td><td>اجزاء الحاسوب الاساسية
Main computer parts</td></tr>
<tr><td>**Week 3**</td><td>تمثيل البيانات
Data Representation</td></tr>
<tr><td>**Week 4**</td><td>عمليات الحاسوب الحسابية
Arithmetic Computer Operations</td></tr>
<tr><td>**Week 5**</td><td>تخزين البيانات
Data Storage</td></tr>
<tr><td>**Week 6**</td><td>ذاكرة الوصول العشوائي وانواعها .
RAM</td></tr>
<tr><td>**Week 7**</td><td>ذاكرة القراءة فقظ وانواعها .
ROM</td></tr>
<tr><td>**Week 8**</td><td>الأنظمة الرقمية</td></tr>
<tr><td>**Week 9**</td><td>التحويل بين الأنظمة الرقمية</td></tr>
<tr><td>**Week 10**</td><td>كيفية تعامل الحاسوب مع الأنظمة الرقمية</td></tr>
<tr><td>**Week 11**</td><td>التعرف نظام البايوز</td></tr>
<tr><td>**Week 12**</td><td>التعرف على كيفية أدارة العمليات في الحاسوب</td></tr>
<tr><td>**Week 13**</td><td>محاضرة على طريقة فرمتت الحاسوب الشخصي</td></tr>
<tr><td>**Week 14**</td><td>**مراجعة عامة للمادة**</td></tr>
<tr><td>**Week 15**</td><td>**Final Exam**</td></tr>
</table>

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	مقدمة عن نظام التشغيل
Week 2	التعرف على سطح المكتب واجزاءه
Week 3	التعرف على أجزاء نظام التشغيل
Week 4	مقدمة عن برنامج مايكروسوفت اوفيس
Week 5	التعرف على الوورد
Week 6	تطبيق عملي على نظام الوورد
Week 7	عمل الجداول في نظام الوورد
Week 8	التعرف على النصوص في الوورد
Week 9	و تنسيق النص واضافة تنسقات اضافية
Week 10	طباعة الملف وتنسيقات الطباعة
Week 11	اختبار تطبيق ادراج الصور والجداول
Week 12	تنسيق الترقيم في الوورد
Week 13	تنسيق التصاميم الجاهزة في الوورد
Week 14	اختبارات عمل وطباعة الكتب الرسمية وتنسيقها
Week 15	Mid Exam

Learning and Teaching Resources						
مصادر التعلم والتدريس						
	Text					**Available in the Library?**
	الرقم المعياري ISBN	**اسماء المؤلفين**	**سنة الاصدار**	**دار النشر**	**عنوان المؤلف**	
Required Texts	9781718500662, 9781718500679, 2020024168, 2020024169 1718500661	Matthew Justice	2020	No Starch Press	How Computers Really Work	
	9780134997193, 1292420103, 9781292420103 9781292420080	William Stallings	2021	Global Edition-Pearson	Computer Organizatio n and Architecture	
	9781284259445, 2022062125 9781284259438	Linda Null	2023	Jones & Bartlett Learning	The Essentials of Computer Organizatio n and Architecture , Sixth Edition	
Recommended Texts						
Websites						

APPENDIX:

Group	Grade	التقدير	Marks (%)	Definition
GRADING SCHEME مخطط الدرجات				
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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Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			

Module Title	Computer Skills	**Module Delivery**	
Module Type	CORE	Theory Lecture Seminar	
Module Code	UOBAB0604022		
ECTS Credits	6		
SWL (hr/sem)	150		

Module Level		1	**Semester of Delivery**	2
Administering Department		Computer Science	**College**	College of Science for Women
Module Leader		Ahmed Mohammed Hussein	**e-mail**	wsci.ahmed.mohammed@uobabylon.edu.iq
Module Leader's Acad. Title		Assist. Prof.	**Module Leader's Qualification**	PhD
Module Tutor	None		**e-mail**	None
Peer Reviewer Name			**e-mail**	
Review Committee Approval		2024-02-29	**Version Number**	

Relation With Other Modules		
العلاقة مع المواد الدراسية الأخرى		
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	تهدف هذه المادة على تطوير الفهم الاساسي لتنظيم وتشغيل جهاز الحاسوب المكتبي بما في ذلك معمارية وحدة المعالجة المركزية , الذاكرة و اجهزة الادخال والاخراج . الطالب سوف يكون قادرا على مناقشة مبادئ تمثيل المعلومات وقادرا على استخدام تمثيل اعداد متنوعة والتحويل بينهم. ايضا , سوف يكتسب الطالب فهم اساسي للخصائص المعمارية لأنظمة الحاسوب الحديثة , بما في ذلك مسارات النقل وتنظيم الذاكرة الحديثة . كما يوفر مقدمة لتنظيم وتشغيل برنامج نظام التشغيل .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. ذاكرة الوصول العشوائي وانواعها. 2. ذاكرة القراءة فقط وانواعها. الذاكرة المؤقتة ووظيفتها. 3. الذاكرة الافتراضية ووظيفتها. 4. اللوحة الام واجهزة الادخال والاخراج.
Indicative Contents المحتويات الإرشادية	1- قراءات، تعلم ذاتي، حلقات نقاش 2- التدريبات والانشطة في قاعة الدرس 3- ارشاد الطلاب الى بعض المصادر والموقع الالكترونية للاستفادة منها.

Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	1- طريقة القاء المحاضرات. 2- Student Center. 3- (المجاميع الطلابية Team Project). 4- (Work shopورش العمل). 5- (Learning Technologies on Campus) (التعلم الالكتروني داخل الحرم الجامعي). 6- (experiential learning التعلم التجريبي) من خلال كتابة برامج حاسوب وتطبيقها ومعرفة مخرجاتها.

Student Workload (SWL)			
الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	100	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / 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	الذاكرة المؤقتة Memory Cache
Week 2	الذاكرة المؤقتة Memory Cache
Week 3	الذاكرة الافتراضية Virtual Memory
Week 4	الذاكرة الافتراضية Virtual Memory
Week 5	اللوحة الام Motherboard
Week 6	أجهزة الادخال Input Devices
Week 7	اجهزة الاخراج Output Devices
Week 8	اختبارات عن المحاضرات السابقة
Week 9	الشاشة والطابعات Monitors and Printers
Week 10	مقدمة عن نظام التشغيل Introduction to Operating System
Week 11	ASCII Code
Week 12	المعالجات وانواعها Microprocessor
Week 13	محاضرة عن صيانة الحاسوب الجزء الثاني
Week 14	Class Assignment
Week 15	**Mid Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	مقدمة عن الاكسل
Week 2	التعرف على الواجهة الرئيسية للاكسل
Week 3	التعرف على الدوال الخاصة بالاكسل
Week 4	التعرف على كيفية التعامل مع الجداول في نظام الاكسل
Week 5	تطبيق عملي على نظام الاكسل
Week 6	تنسيق الرسوم وادراجها
Week 7	عمل الاحصائيات العامة الضرورية
Week 8	اختبارات عن تطبيق الاكسل
Week 9	مقدمة عن البوربوينت
Week 10	التعرف على كيفية انشاء السلايد في نظام البوربوينت
Week 11	معرفة الحركات وأجزاء البوربوينت الرئيسية
Week 12	تطبيق عملي على نظام البوربوينت
Week 13	كيفية تحويل محاضرة الى عرض تقدمي في البوربوينت
Week 14	اختبارات عن تطبيق البوربوينت
Week 15	Mid Exam

Learning and Teaching Resources					
مصادر التعلم والتدريس					
	Text				Available in the Library?
	الرقم المعياري ISBN	اسماء المؤلفين	سنة الاصدار	دار النشر	عنوان المؤلف	
Required Texts	9811656614, 9789811656613	Shuangbao Paul Wang	2021	Springer	Computer Architecture and Organization: Fundamentals and Architecture Security	
	0128203315, 9780128203316	David A. Patterson, John L. Hennessy	2020	Morgan Kaufmann	Computer Organization and Design RISC-V Edition: The Hardware Software Interface, Second Edition	

	,1498772714 9781498772 ,716 ,1498772722 9781498772 723	Joseph D. Dumas II	2016	CRC Press	Computer architecture: fundamentals and principles of computer design	
Recommended Texts						
Websites						

APPENDIX:

<table>
<tr><th colspan="5">GRADING SCHEME
مخطط الدرجات</th></tr>
<tr><th>Group</th><th>Grade</th><th>التقدير</th><th>Marks (%)</th><th>Definition</th></tr>
<tr><td rowspan="5">Success Group
(50 - 100)</td><td>A - Excellent</td><td>امتياز</td><td>90 – 100</td><td>Outstanding Performance</td></tr>
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<tr><td>E - Sufficient</td><td>مقبول</td><td>50 – 59</td><td>Work meets minimum criteria</td></tr>
<tr><td rowspan="2">Fail Group
(0 – 49)</td><td>FX – Fail</td><td>مقبول بقرار</td><td>(45-49)</td><td>More work required but credit awarded</td></tr>
<tr><td>F – Fail</td><td>راسب</td><td>(0-44)</td><td>Considerable amount of work required</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Note:</td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
</table>

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

Ministry of Higher Education and
Scientific Research - Iraq
University of Babylon
College of Science for Women
Computer Science

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		

Module Title	Language Translator 1		Module Delivery	
Module Type	CORE		Theory	
Module Code			Lecture	
ECTS Credits	1		Seminar	
SWL (hr/sem)				

Module Level	3	Semester of Delivery	1
Administering Department	Computer Science	College	College of Science for Women
Module Leader	Esraa Alwan	e-mail	esraa.hadi@uobabylon.edu.iq
Module Leader's Acad. Title	Prof.	Module Leader's Qualification	PhD
Module Tutor	None	e-mail	None
Peer Reviewer Name		e-mail	
Review Committee Approval		Version Number	

<table>
<tr><td colspan="4" align="center">**Relation With Other Modules**
العلاقة مع المواد الدراسية الأخرى</td></tr>
<tr><td>**Prerequisite module**</td><td>None</td><td>**Semester**</td><td></td></tr>
<tr><td>**Co-requisites module**</td><td>None</td><td>**Semester**</td><td></td></tr>
<tr><td colspan="4" align="center">**Module Aims, Learning Outcomes and Indicative Contents**
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية</td></tr>
<tr><td>**Module Aims**
أهداف المادة الدراسية</td><td colspan="3">1. To develop knowledge in compiler design
2. To develop lexical analyzers, parsers, and small compilers using different tools
3. To develop lexical analyzers, parsers, and small compilers by using general purpose programming languages</td></tr>
<tr><td>**Module Learning Outcomes**

مخرجات التعلم للمادة الدراسية</td><td colspan="3">1. Parse tree construction - Construct a parse tree, or explain why no parse tree exists, given a BNF grammar and a string over the appropriate alphabet. () Lexical analyzer implementation - Implement a lexical analyzer from a specification of a language's lexical rules.
2. Compute FIRST set - Compute the FIRST set for a BNF grammar.
3. Compute follow set - Compute the FOLLOW set for a BNF grammar. determine FIRST intersect FIRST constraint satisfaction - determine if a BNF grammar satisfies the constraint on intersection of FIRST sets required for single-symbol-lookahead, top-down, lookahead parsing () determine FIRST intersect FOLLOW constraint satisfaction - determine if a BNF grammar satisfies the constraint on intersection of FIRST and FOLLOW sets required for single-symbol-lookahead, top-down, lookahead parsing.
4. Check for left recursion - determine if a BNF grammar satisfies the constraint on left recursion for single-symbol-lookahead, top-down, lookahead construct parser - design and implement a single-symbol-lookahead, top-down, lookahead parser from a BNF grammar()</td></tr>
<tr><td>**Indicative Contents**
المحتويات الإرشادية</td><td colspan="3"></td></tr>
<tr><td colspan="4" align="center">**Learning and Teaching Strategies**
استراتيجيات التعلم والتعليم</td></tr>
<tr><td>**Strategies**</td><td colspan="3"></td></tr>
</table>

<table>
<tr><td colspan="4" align="center">**Student Workload (SWL)**
الحمل الدراسي للطالب</td></tr>
<tr><td>**Structured SWL (h/sem)**
الحمل الدراسي المنتظم للطالب خلال الفصل</td><td></td><td>**Structured SWL (h/w)**
الحمل الدراسي المنتظم للطالب أسبوعيا</td><td></td></tr>
<tr><td>**Unstructured SWL (h/sem)**
الحمل الدراسي غير المنتظم للطالب خلال الفصل</td><td></td><td>**Unstructured SWL (h/w)**
الحمل الدراسي غير المنتظم للطالب أسبوعيا</td><td></td></tr>
<tr><td>**Total SWL (h/sem)**
الحمل الدراسي الكلي للطالب خلال الفصل</td><td colspan="3"></td></tr>
</table>

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

<table>
<tr><td colspan="2" align="center">Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري</td></tr>
<tr><td>Week</td><td>Material Covered</td></tr>
<tr><td>Week 1</td><td>Introduction to Compiler, Cousins of Compiler (Translator, assembler, interpreter, loader, linker etc), Phases of Compilers.</td></tr>
<tr><td>Week 2</td><td>Operation in each phase of a Compiler, lexical analyzer, syntax analyzer, semantics analyzer, symbol table manager, error handler, intermediate code generator, code optimizer, code generator.</td></tr>
<tr><td>Week 3</td><td>Role of the lexical analyzer, issues in lexical analysis, tokens, patterns, lexemes. Specification of tokens, Strings and languages, Finite automata, DFA, NFA</td></tr>
<tr><td>Week 4</td><td>Equivalence of NFA and DFA, Conversion of NFA to DFA.</td></tr>
<tr><td>Week 5</td><td>Minimizing states of DFA, Є-NFA</td></tr>
<tr><td>Week 6</td><td>Regular Expression, regular grammar, Conversion of regular expression into NFA</td></tr>
<tr><td>Week 7</td><td>Midterm exam</td></tr>
<tr><td>Week 8</td><td>The role of Parser, Syntactic errors and recovery actions</td></tr>
<tr><td>Week 9</td><td>Context free Grammar, Parse Tree, Parse tree Derivation, Left most Derivation, Right most derivation, ambiguity.</td></tr>
<tr><td>Week 10</td><td>Eliminating ambiguity, predictive parsing, Recursive decent parsing, predictive parsing using tables</td></tr>
<tr><td>Week 11</td><td>Top-down parsing, bottom-up parsing, shift reduce parsing using the ACTION/GOTO Tables</td></tr>
<tr><td>Week 12</td><td>Top-Down Parsing: Recursive-Descent Parsing, FIRST and FOLLOW, LL (1) Grammars</td></tr>
<tr><td>Week 13</td><td>Bottom-Up Parsing: Handle Pruning, Shift-Reduce Parsing, Conflicts During Shift-Reduce Parsing</td></tr>
<tr><td>Week 14</td><td>LR Parsing: Simple LR, Items and the LR (0) Automaton, Constructing SLR-Parsing Tables, Viable Prefixes</td></tr>
<tr><td>Week 15</td><td>Canonical LR parser: Constructing LR(1) Sets of Items, Constructing LALR Parsing Tables</td></tr>
<tr><td>Week 16</td><td>Final Exam</td></tr>
</table>

| Delivery Plan (Weekly Lab. Syllabus) |
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Flex tool introduction
Week 2	Format of input file with example
Week 3	Patterns
Week 4	Building digit and letter using flex
Week 5	Building Identifier using flex
Week 6	Building Constant using flex
Week 7	Reserved word
Week8	Midterm exam
Week9	Construct regular expression
Week10	Complex number
Week11	More example about lexical analysis
Week 12	Project for building lexical analysis
Week13	Project reading from file
Week 14	Project final
Week 15	Final exam

| Learning and Teaching Resources | | |
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	[1] Alfred V. Aho, Monica S. Lam,Ravi Sethi, Jeffrey D. Ullman., **"Compilers, principles, techniques, and tools "**, Addison Wesley, 2007. [2] Dick Grune, Henri E. Bal, Ceriel J.H. Jacobs, Koen G. Langendoen ," Modern Compiler Design ", John Wiley & Sons, 2000. [3] Flex and Bison, unix text processing tools, John Levine, 2009.	
Recommended Texts		
Websites		

APPENDIX:

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

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Computer Science

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		
Module Title	Microprocessor and Assembly Language	**Module Delivery**
Module Type	CORE	Theory Lecture Seminar
Module Code		
ECTS Credits		
SWL (hr/sem)	60 ساعة	

Module Level		1	**Semester of Delivery**		1
Administering Department		Computer	**College**	Computer Science for Women	
Module Leader	Hussein A. Lafta		**e-mail**	wsci.husein.attia@uobabylon.edu.iq	
Module Leader's Acad. Title		Prof. Dr.	**Module Leader's Qualification**		Phd
Module Tutor	Hussein A. Lafta				
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**Version Number**		

Relation With Other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	NONE	**Semester**	1
Co-requisites module	NONE	**Semester**	1

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This unit guide is intended to provide a general idea of the teaching content and assessment criteria for the unit entitled Microprocessor. General aims are to provide an understanding of the operation of microprocessors and their interfacing components, and to offer essential design considerations in Microprocessor and Computer Interfacing applications. Microprocessors and Interfacing deals with the general principles of microprocessor design and interfacing by looking at the Intel 8086 microprocessor and its associated peripheral interface chips. Programming the microprocessor is done using the TASM assembly language on the PC. This is done to emphasis the sequence of operations of software code and their implications on the hardware. The unit deals with microprocessor architecture, operation of registers and data manipulation as well a program control
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the course, students will be able to: 1- Understand components of the computers, microprocessors. 2- Know how to approach and undertake microprocessor development. 3- Learning role of CPU, registers, buses. 4- Know how interface memory and peripheral devices to a microprocessor. 5- Learning addressing modes (Immediate, direct, extended, indexed, indexed-indirect, and relative addressing modes). 6- Know the architecture of the 80x86-type microprocessor. Its capabilities and limitation and how it fits in with modern computers. 7- Understanding the function of each pin in 8086 microprocessors. 8- Learning interrupt vectors, interrupt process, interrupt priorities, external and advanced interrupts 9- Learning how to write program in assembly language using TASM. .
Indicative Contents المحتويات الإرشادية	This unit guide is intended to provide a general idea of the teaching content and assessment criteria for the unit entitled Microprocessor. General aims are to provide an understanding of the operation of microprocessors and their interfacing components, and to offer essential design considerations in Microprocessor and Computer Interfacing applications. Microprocessors and Interfacing deals with the general principles of microprocessor design and interfacing by looking at the Intel 8086 microprocessor and its associated peripheral interface chips. Programming the microprocessor is done using the TASM assembly language on the PC. This is done to emphasis the sequence of operations of software code and their implications on the hardware. The unit deals with microprocessor architecture, operation of registers and data manipulation as well a program control.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	1- Use smart screens in addition to regular whiteboards.
	2- Display the lecture on the university website, as well as on the college and department websites.
	3- Focus on discussion groups between professors and students.
	4- Encourage self-learning and help students draw conclusions.
	5- Emphasize competition among students.

Student Workload (SWL)
الحمل الدراسي للطالب

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

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	3	10	3,6,8	
	Assignments	3	10	2,4,7	
	Projects / Lab.	1	10	10	
	Report	1	10	3	
Summative assessment	**Midterm Exam**	2hr	10	7	
	Final Exam	3h	50	16	
Total assessment			100		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction and History of Microprocessors; Basic Block Diagram of a computer; Organization of Microprocessor Based System; Bus Organization.
Week 2	Stored program Concept and Von Neumann Machine; Processing Cycle of a Stored Program Computer
Week 3	Microinstructions and Hardwired/Microprogrammed Control Unit ; Introduction to Register Transfer Language
Week 4	Internal Architecture and Features of 8086 Microprocessor ; BIU and Components; EU and Components
Week 5	EU and BIU Operations; Segment and EU and BIU Operations; Segment and Offset Address
Week 6	Move,XChange,Push,Pup
Week 7	ADD,SUB Instructions
Week 8	First Exam
Week 9	AND, OR, XOR, NOT Instructions
Week 10	shift and rotate instructions
Week 11	Review
Week 12	Simple Programs for Arithmetic, Logical, String Input/Output
Week 13	Design and implement (Simple Project
Week 14	Design and implement (Simple Project)
Week 15	**Second Examination**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Setting up the emu8086 simulation
Week 2	the concept of Assembly Language
Week 3	Practical basic on assembly language
Week 4	learn to build a code using emu8086 simulation
Week 5	Learn to create code for data transfer instruction set
Week 6	Learn to create code for data transfer instruction set
Week 7	Learn to convert from Assembly language to machine language

Week 8	Learn to convert from Assembly language to machine language
Week 9	Learn to create code for arithmetic and logical instruction set
Week 10	Learn to create code for arithmetic and logical instruction set
Week 11	Learn to deal with variable and array in emu8086 simulation
Week 12	Learn to deal with variable and array in emu8086 simulation
Week 13	Learn to create code for rotate and shift instruction set
Week 14	Learn to create code for rotate and shift instruction set
Week 15	implemented a code for preparing to the final exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. John Uffenbeck, The 8086Design, Programming and Interfacing. 2012. 2-Barry B. Brey, " The Intel Microprocessors 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, and Pentium Pro Processor rchitecture, Programming, and Interfacing, 6th Edition, Prentic-Hall Inc., 2003.	
Recommended Texts	Complete Notes of Microprocessor with Tutorials and Solutions [1] Published by Raju Dawadi at January 7, 2016 J. T. Streib, Guide to Assembly Language: A Concise Introduction, [2] Springer-Verlag London Limited, 2011	
Websites	• http://www.emu8086.com	

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GRADING SCHEME مخطط الدرجات				
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Ministry of Higher Education and
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College of Science for Women
Computer Science

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Logic Design		**Module Delivery**	
Module Type	CORE		Theory Lecture Seminar	
Module Code				
ECTS Credits				
SWL (hr/sem)	ساعة 60			
Module Level	2	**Semester of Delivery**		2
Administering Department	Computer	**College**	Computer Science for Women	
Module Leader	Hussein A. Lafta	**e-mail**	Wsci.husein.attia@uobabylon.edu.iq	
Module Leader's Acad. Title	Prof. Dr.	**Module Leader's Qualification**		PhD
Module Tutor	Hussein A. Lafta			
Peer Reviewer Name		**e-mail**		
Review Committee Approval		**Version Number**		

Relation With Other Modules		
العلاقة مع المواد الدراسية الأخرى		
Prerequisite module	NONE	**Semester**
Co-requisites module	NONE	**Semester**

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Able to perform the conversion among different number systems; Familiar with basic logic gates -- AND, OR & NOT, XOR, XNOR; Independently or work in team to build simple logic circuits using basic. 2. Understand Boolean algebra and basic properties of Boolean algebra; able to simplify simple Boolean functions by using the basic Boolean properties. 3. Able to design simple combinational logics using basic gates. Able to optimize simple logic using Karnaugh maps, understand "don t care". 4. Familiar with basic sequential logic components: SR Latch, D Flip-Flop and their usage and able to analyze sequential logic circuits. 5. Understand finite state machines (FSM) concept and work in team to do sequence circuit design-based FSM and state table using D-FFs. 6. Familiar with basic combinational and sequential components used in the typical data path designs: Register, Adders, Shifters, Comparators; Counters, Multiplier, Arithmetic-Logic Units (ALUs), RAM. Able to do simple register-transfer level (RTL) design. 7. Able to understand and use one high-level hardware description languages (VHDL or Verilog) to design combinational or sequential circuits. 8. Understand that the design process for today s billion-transistor digital systems becomes a more programming-based process than before and programming skills are important.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	✓ The student should understand encoder, decoder and multiplexers. ✓ The student should understand flip-flops and how to use them. ✓ The student should understand registers and their types. ✓ The student should understand counters and their types. ✓ The student should understand ROM and PLA implementation.
Indicative Contents المحتويات الإرشادية	This course covers the logic design advanced concepts. It starts with combinational logic circuit design. From these designs are adder and subtractor. This course also covers the explanation of different circuit such as decoder, encoder and multiplexers. At the end of course, the flip-flop, latches and counter are covered.

Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	✓ The student should use utilities in the lab to apply scientific experiment. ✓ The ability to design a logic circuit.

<table>
<tr><td colspan="4" align="center">Student Workload (SWL)
الحمل الدراسي للطالب</td></tr>
<tr><td>Structured SWL (h/sem)
الحمل الدراسي المنتظم للطالب خلال الفصل</td><td></td><td>Structured SWL (h/w)
الحمل الدراسي المنتظم للطالب أسبوعيا</td><td></td></tr>
<tr><td>Unstructured SWL (h/sem)
الحمل الدراسي غير المنتظم للطالب خلال الفصل</td><td></td><td>Unstructured SWL (h/w)
الحمل الدراسي غير المنتظم للطالب أسبوعيا</td><td></td></tr>
<tr><td>Total SWL (h/sem)
الحمل الدراسي الكلي للطالب خلال الفصل</td><td colspan="3"></td></tr>
</table>

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

<table>
<tr><td colspan="2" align="center">Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري</td></tr>
<tr><td></td><td>Material Covered</td></tr>
<tr><td>Week 1</td><td>NUMBERS USED IN DIGITAL ELECTRONICS</td></tr>
<tr><td>Week 2</td><td>BASIC LOGIC GATES</td></tr>
<tr><td>Week 3</td><td>OTHER LOGIC GATES</td></tr>
<tr><td>Week 4</td><td>SIMPLIFYING LOGIC CIRCUITS: MAPPING</td></tr>
<tr><td>Week 5</td><td>Offset Address</td></tr>
<tr><td>Week 6</td><td>SIMPLIFYING LOGIC CIRCUITS: MAPPING</td></tr>
<tr><td>Week 7</td><td>Karnaugh Maps</td></tr>
<tr><td>Week 8</td><td>CODE CONVERSION</td></tr>
<tr><td>Week 9</td><td>BINARY ARITHMETIC AND ARITHMETIC CIRCUITS</td></tr>
<tr><td>Week 10</td><td>FLIP-FLOPS AND OTHER</td></tr>
</table>

	MULTMBRATORS
Week 11	COUNTERS
Week 12	Parallel Counters
Week 13	EXAMINATION
Week 14	SHIFT REGISTERS
Week 15	**MICROCOMPUTER MEMORY**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	number conversation
Week 2	And,OR ,NOT GATES REPRESENTATION
Week 3	NAND,NOR,XOR REPRESENTATION
Week 4	NAND,NOR,XOR REPRESENTATION
Week 5	Karnaugh Maps REPRESANTAION
Week 6	CODE CONVERSION REPRESANTATION
Week 7	BINARY ARITHMETIC AND ARITHMETIC CIRCUITS REPRESANTATION
Week 8	SR FF REPRESANTATION
Week 9	COUNTERS (SERIAL COUNTER) REPRESANTATION
Week 10	Parallel Counters REPRESANTATION
Week 11	EXAMINATION
Week 12	SHIFT REGISTERS REPRESANTAION
Week 13	MICROCOMPUTER MEMORY REPRESANATION
Week 14	Design n-bits Adder Subtractor
Week 15	Design circuit for converting from gray code to binary using XOR Gates.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. John Uffenbeck, The 8086Design, Programming and Interfacing. 2012. 2. Barry B. Brey, " The Intel Microprocessors 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, and Pentium Pro Processor architecture, Programming, and Interfacing, 6th Edition, Prentic-Hall Inc., 2003.	

Recommended Texts	1. Complete Notes of Microprocessor with Tutorials and Solutions Published by Raju Dawadi at January 7, 2016. 2. J. T. Streib, Guide to Assembly Language: A Concise Introduction, Springer-Verlag London Limited, 2011.	
Websites	http://www.emu8086.com	

APPENDIX:

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

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

Ministry of Higher Education and
Scientific Research - Iraq
University of Babylon
College of Science for Women
Computer Science

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Data Structures	**Module Delivery**	
Module Type	CORE	▪ **Theory Lecture** ▪ **Particular Lecture** ▪ **Project**	
Module Code	UOBABCOM21014		
ECTS Credits	5		
SWL (hr/sem)	**125**		
Module Level	2	**Semester of Delivery**	1
Administering Department	Computer Science	**College**	College of Science for Women
Module Leader	Prof. Dr. Samaher Al-Janabi	**e-mail**	samaher@uobabylon.edu.iq samaher@itnet.uobabylon.edu.iq
Module Leader's Acad. Title	Prof.	**Module Leader's Qualification**	Ph.D
Module Tutor	None	**e-mail**	None
Peer Reviewer Name		**e-mail**	
Review Committee Approval	15/09/2024	**Version Number**	

Relation With Other Modules		
العلاقة مع المواد الدراسية الأخرى		
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

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

Module Aims أهداف المادة الدراسية	The typical data structures course, which introduces a collection of fundamental data structures and algorithms, can be taught using any of the different programming languages available today. In recent years, more colleges have begun to adopt the Python language for introducing students to programming and problem solving. Python provides several benefits over other languages such as C++ and Java, the most important of which is that Python has a simple syntax that is easier to learn. This book expands upon that use of Python by providing a Python-centric text for the data structures course. The clean syntax and powerful features of the language are used throughout, but the underlying mechanisms of these features are fully explored not only to expose the \magic" but also to study their overall For a number of years, many data structures textbooks have been written to serve a dual role of introducing data structures and providing an in-depth study of object-oriented programming (OOP). In some instances, this dual role may compromise the original purpose of the data structures course by placing more focus on OOP and less on the abstract data types and their underlying data structures. To stress the importance of abstract data types, data structures, and algorithms, we limit the discussion of OOP to the use of base classes for implementing the various abstract data types. We do not use class inheritance or polymorphism in the main part of the text but instead provide a basic introduction as an appendix. This choice was made for several reasons. First, our objective is to provide a \back to basics" approach to learning data structures and algorithms without overwhelming the reader with all of the OOP terminology and concepts, which is especially important when the instructor has no plans to cover such topics. Second, different instructors take different approaches with Python in their first course. 1. focus on the known data structures and algorithms, also designing the examples to allow the introduction of object-oriented programming if so desired. 2. data structures are introduced, with the major details contained in individual sections. 3. Understuend the main principle of Python. • **Prerequisites** This course assumes that the student has completed the standard introduction to programming and problem-solving course using the Python language. Since the contents of the first course can differ from college to college and instructor to instructor, we assume the students are familiar with or can do the following: ✓ Design and implement complete programs in Python, including the use of modules and namespaces

	✓ Apply the basic data types and constructs, including loops, selection statements, and subprograms (functions) ✓ Create and use the built-in list and dictionary structures ✓ Design and implement basics classes, including the use of helper methods and private attributes
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**Understanding Fundamental Concepts** ▪ **Define Data**: Explain the concept of data and its significance in computing. ▪ **Define Information**: Distinguish between data and information, emphasizing how data becomes meaningful when processed. ▪ **Define Algorithm**: Describe what an algorithm is and its role in problem-solving within data structures. ▪ **Define Data Structure**: Understand the definition of data structures and their importance in organizing and managing data efficiently. **Arrays** ▪ **One Dimensional Array**: Describe the structure and use cases of one-dimensional arrays. ▪ **Two Dimensional Arrays**: Explain the concept and applications of two-dimensional arrays. ▪ **Three Dimensional Arrays**: Understand three-dimensional arrays and their representation. ▪ **Triangular Matrix**: Define triangular matrices and discuss their applications. ▪ **Representation of Arrays**: Illustrate different methods for representing arrays in memory. **Stack & Notations** ▪ **Stack**: Define stacks, including their properties and operations. ▪ **Main Applications of Stack**: Identify and explain various applications of stacks in computing, such as expression evaluation and backtracking. ▪ **Algorithm of Stack**: Outline algorithms for common stack operations (push, pop, peek). ▪ **Conversion of Infix Expression to Reverse Polish Notation**: Explain the process of converting infix expressions to Reverse Polish Notation using stacks. **Queues** ▪ **Simple Queue**: Define simple queues and their operations. ▪ **Algorithm Insert of Queue**: Describe the algorithm for inserting elements into a queue. ▪ **Algorithm Delete of Queue**: Explain the deletion algorithm for queues. ▪ **Circular Queue**: Define circular queues and their advantages over simple queues. ▪ **Algorithm Insert of Circular Queue**: Outline the insertion algorithm specific to circular queues. ▪ **Algorithm Delete of Circular Queue**: Describe the deletion process for circular queues. **Linked Structures** ▪ **Static Structures**: Define static linked structures and their characteristics. ▪ **Dynamic Structures**: Explain dynamic linked structures and how they differ from static ones. ▪ **Pointers**: Discuss the role of pointers in linked structures. ▪ **Linked List**: Describe linked lists, their types, and uses. ▪ **Algorithm Insert Element to the Start of Linked List**: Outline the algorithm for inserting an element at the beginning of a linked list. ▪ **Algorithm Insert Element to the Middle of Linked List**: Explain how to insert an element in the middle of a linked list. ▪ **Algorithm Insert Element to the End of Linked List**: Describe the process for adding an element at the end of a linked list. **Types of Linked Structures** ▪ **Linked Stack**: Define linked stacks and discuss their implementation. ▪ **Linked Queue**: Explain linked queues and their advantages over simple queues.

| | ▪ **Circular Linked List**: Describe circular linked lists and their applications. |
| | ▪ **Double Linked List**: Discuss double linked lists, including their structure and uses. |

Graphics
- ▪ **Definition of Graph**: Define what a graph is in computer science terms.
- ▪ **Types of Graphs**:
  - ✓ *Undirected Graph*: Explain undirected graphs.
  - ✓ *Directed Graph*: Describe directed graphs.
- ▪ **Graph Representation**: Discuss various methods for representing graphs, including adjacency matrices and adjacency lists.

Types of Edges
- ▪ **Primary Path**: Define primary paths within graphs.
- ▪ **Simple Path**: Explain what constitutes a simple path in graph theory.
- ▪ **Compound Path**: Discuss compound paths and their characteristics.
- ▪ **Circular Path**: Define circular paths within graphs.

Trees
- ▪ **Tree Types**: Identify different types of trees used in data structures.
- ▪ **Transformation of a General Tree into Binary Tree**: Explain how to convert general trees into binary trees.
- ▪ **Tree Traversing Techniques**:
  - ✓ *Level by Level Traversing*: Describe level-order traversal.
  - ✓ *Preorder Traversing*: Explain preorder traversal method.
  - ✓ *In-order Traversing*: Discuss in-order traversal.
  - ✓ *Post-order Traversing*: Outline post-order traversal technique.

Tree Representation
- ▪ **General Tree Representation**:
  - ✓ *Max Number of Branches*: Discuss constraints on branches in general trees.
  - ✓ *Two Pointers (Sun, Brother)*: Explain pointer representation for general trees.
  - ✓ *Three-Pointers (Sun, Brother, Father)*: Describe advanced pointer representation techniques.
- ▪ **Binary Tree Representation**:
  - ✓ *One Dimension Array*: Illustrate binary tree representation using one-dimensional arrays.
  - ✓ *Two Dimensions Array*: Discuss two-dimensional array representations.
  - ✓ *Two Pointers (Left Child, Right Child)*: Explain binary tree node representation using two pointers.
  - ✓ *Three Pointers (Left Child, Right Child, Father)*: Discuss advanced binary tree node representation techniques.

| **Indicative Contents**
المحتويات الإرشادية | **1. Fundamental Concepts**
- ▪ **Data**: Definition and significance in computing.
- ▪ **Information**: Distinction between data and information.
- ▪ **Algorithm**: Role and definition of algorithms in problem-solving.
- ▪ **Data Structure**: Importance and definition of data structures.
2. Arrays
- • **One Dimensional Array**: Structure, representation, and use cases.
- • **Two Dimensional Arrays**: Concept, applications, and representation.
- • **Three Dimensional Arrays**: Understanding and representation.
- • **Triangular Matrix**: Definition, properties, and applications.
- • **Representation of Arrays**: Methods for representing arrays in memory.
3. Stack & Notations
- • **Stack**: Definition, properties, and operations.
- • **Main Applications of Stack**: Use cases in computing (e.g., expression evaluation).
- • **Algorithm of Stack**: Push, pop, and peek operations.
- • **Infix to Reverse Polish Notation Conversion**: Process and algorithms involved.
4. Queues
- • **Simple Queue**: Definition, operations, and applications. |

- **Insert Algorithm for Queue**: Detailed algorithm for inserting elements.
- **Delete Algorithm for Queue**: Process for removing elements from a queue.
- **Circular Queue**: Definition, advantages, and representation.
- **Insert Algorithm for Circular Queue**: Insertion process specific to circular queues.
- **Delete Algorithm for Circular Queue**: Deletion process for circular queues.

5. Linked Structures
- **Static Structures**: Characteristics and examples.
- **Dynamic Structures**: Differences from static structures.
- **Pointers**: Role of pointers in linked structures.
- **Linked List**: Definition, types, and applications.
    - *Insert Element at Start*: Algorithm for insertion at the beginning.
    - *Insert Element in the Middle*: Algorithm for middle insertion.
    - *Insert Element at End*: Algorithm for end insertion.

6. Types of Linked Structures
- **Linked Stack**: Definition and implementation details.
- **Linked Queue**: Advantages over simple queues and implementation.
- **Circular Linked List**: Structure and applications.
- **Double Linked List**: Characteristics and uses.

7. Graphics
- **Graph Definition**: Basic definition of graphs in computer science.
- **Types of Graphs**:
    - *Undirected Graph*: Characteristics and examples.
    - *Directed Graph*: Characteristics and examples.
- **Graph Representation Methods**:
    - *Adjacency Matrix*: Structure and usage.
    - *Adjacency Lists*: Structure and usage.

8. Types of Edges
- **Primary Path**: Definition and characteristics.
- **Simple Path**: Explanation of simple paths in graphs.
- **Compound Path**: Characteristics of compound paths.
- **Circular Path**: Definition and examples.

9. Trees
- **Tree Types**: Overview of various tree structures (binary trees, AVL trees, etc.).
- **Transformation from General Tree to Binary Tree**: Process of conversion.

10. Tree Traversing Techniques
- *Level by Level Traversing*: Explanation of level-order traversal method.
- *Preorder Traversing*: Description of preorder traversal process.
- *In-order Traversing*: Explanation of in-order traversal method.
- *Post-order Traversing*: Description of post-order traversal process.

11. Tree Representation
- **General Tree Representation Techniques**:
    - *Max Number of Branches*: Constraints on branches in general trees.
    - *Pointer Representation*: Two pointers (Sun, Brother) and three pointers (Sun, Brother, Father).
- **Binary Tree Representation Techniques**:
    - *One-Dimensional Array Representation*: Structure using arrays.
    - *Two-Dimensional Array Representation*: Structure using matrices.
    - *Pointer Representation*: Two pointers (Left Child, Right Child) and three pointers (Left Child, Right Child, Father).

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	1. Interactive Learning Environments
	• **Utilizing Smart Screens**: Incorporate smart screens alongside traditional blackboards to enhance visual learning. This allows for dynamic presentations, interactive demonstrations, and real-time engagement with digital content.
	2. Online Resources
	• **Lecture Accessibility**: Provide students with access to recorded lectures on the college website and through the learning management system (Moodle). This enables students to review materials at their own pace and reinforces learning through repeated exposure.
	3. Collaborative Discussions
	• **Discussion Sessions**: Foster an environment that encourages active participation through focused discussion sessions between professors and students. This strategy promotes critical thinking, allows for clarification of concepts, and enhances understanding through peer interaction.
	4. Promoting Self-Learning
	• **Encouraging Independent Study**: Motivate students to engage in self-directed learning by providing resources and guidance that help them draw their own conclusions. This approach cultivates critical thinking skills and fosters a sense of ownership over their educational journey.
	5. Assignments and Activities
	• **Graded Activities**: Assign various activities and projects that relate to the course content, allocating a percentage of the overall grade for these tasks. This not only reinforces learning but also encourages students to apply theoretical concepts in practical scenarios, enhancing their understanding of data structures.

Student Workload (SWL)
الحمل الدراسي للطالب

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	65	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	2	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	Understanding the concepts of data, information, algorithms, and data structures along with their types.
Week 2	Familiarizing oneself with the types of arrays: one-dimensional, two-dimensional, three-dimensional, and triangular arrays, as well as methods for representing them in memory.
Week 3	Gaining knowledge about stacks, including algorithms for adding and removing elements, their real-world applications, and their use in converting between different notation systems.
Week 4	Exploring various types of queues, such as simple and circular queues, and discussing algorithms for adding and removing elements from different positions (beginning, middle, end).
Week 5	Understanding the fundamental differences between static and dynamic programming.
Week 6	Discussing algorithms for adding and removing elements from various positions within linked structures (beginning, middle, end).
Week 7	Familiarizing oneself with different types of linked structures.
Week 8	Understanding circular and double linked structures, along with their methods for adding and removing elements.
Week 9	Conducting the first practical and theoretical exam.
Week 10	Learning about different types of graphs and methods for representing them in memory and on computers
Week 11	Understanding the various types of edges: primary, simple, compound, and complex edges, as well as how to identify them in any graph.
Week 12	Exploring trees, including how to add elements to them and search for specific elements within them.
Week 13	Learning about different traversal methods for trees.
Week 14	Understanding how to represent general trees and binary trees using dynamic programming.
Week 15	Conducting the second midterm exam.
Week 16	Evaluating projects designed by each student.

	Learning and Teaching Resources مصادر التعلم والتدريس	
	Text	**Available in the Library?**
Required Texts		
Recommended Texts	1. Problem Solving in Data Structures & Algorithms Using Python, First Edition, By Hemant Jain, 2016 2. Data Structures and Algorithms Using Python, Rance D. Necaise, Department of Computer Science, College of William and Mary, 2011 3. Main Principle of Python and Real Applications in world ; 2023	**yes**
Websites	**https://maxwellacademic.wixsite.com/website**	

APPENDIX:

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

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ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

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Ministry of Higher Education and Scientific Research - Iraq
University of Babylon
College of Science for Women
Computer Science

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	Human Computer Interaction		Module Delivery	
Module Type	CORE		Theory Lecture Seminar	
Module Code	COM47033			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level		4	**Semester of Delivery**	7
Administering Department		Computer science	**College**	Sciw
Module Leader		Dr. Suhad Ahmed Ali	**e-mail**	wsci.suhad.ahmed@uobabylon.edu.iq
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	None		**e-mail**	None
Peer Reviewer Name			**e-mail**	
Review Committee Approval		01/06/2023	**Version Number**	

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Acquire the knowledge and skills needed to create highly usable software systems. 2. Understand the basics of human and computational abilities and limitations. 3. Understand basic theories, tools and techniques in HCI. 4. Understand the fundamental aspects of designing and evaluating interfaces. Practice a variety of simple methods for evaluating the quality of a user interface.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A student who has completed the course should have the following learning outcomes defined in terms of knowledge, skills and general competence: **Knowledge** The student • knows a definition of interaction design and human-computer interaction. • knows the concepts of usability, user experience and user-centered design. • knows the lifecycle model of interaction design. • has knowledge about different kinds of requirements. • knows the key concepts and terms used in evaluation. • has knowledge of different types of evaluation methods. **Skills** The student • can outline and discuss usability goals and user experience goals for designing an interactive product • can identify suitable methods for evaluating interactive technologies • can identify suitable methods for establishing requirements
Indicative Contents المحتويات الإرشادية	Human perception and information processing, models of human-computer interaction, interaction design basics, HCI in the software process, evaluation techniques, usability, fundamentals of information visualization, space perception and presenting data in space.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	In congruence with the teaching and learning strategy of the college, the following tools are used: • Lectures, class discussions, problem-solving sessions, and review of real-world cases based on specific theoretical concepts. • Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share in the overall internal evaluation

<table>
<tr><th colspan="5">Student Workload (SWL)
الحمل الدراسي للطالب</th></tr>
<tr>
<td>Structured SWL (h/sem)
الحمل الدراسي المنتظم للطالب خلال الفصل</td>
<td>47</td>
<td>Structured SWL (h/w)
الحمل الدراسي المنتظم للطالب أسبوعيا</td>
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الحمل الدراسي غير المنتظم للطالب خلال الفصل</td>
<td>78</td>
<td>Unstructured SWL (h/w)
الحمل الدراسي غير المنتظم للطالب أسبوعيا</td>
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<td>Total SWL (h/sem)
الحمل الدراسي الكلي للطالب خلال الفصل</td>
<td colspan="3">125</td>
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</table>

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
	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 to HCI, History & Usages
Week 2	Human Cognition: Human perception and information processing
Week 3	Human Cognition: Human perception and information processing
Week 4	Computer Input Output Channels
Week 5	models of human-computer interaction
Week 6	models of human-computer interaction
Week 7	interaction design basics
Week 8	**Mid Term Exam**
Week 9	HCI in the software process
Week 10	evaluation techniques
Week 11	Usability guidelines and principles

Week 12	fundamentals of information visualization
Week 13	space perception and presenting data in space.
Week 14	space perception and presenting data in space.
Week 15	**Final Exam**

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Human Computer Interaction, 3rd Edition, Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale Prentice Hall, 2004. ISBN 0-13-046109-1. 2. Human Computer Interaction Handbook: Fundamentals, Evolving Technologies, Originally published: January 1, 2012 Editor: Julie A. Jacko	
Recommended Texts	J. Preece, Y. Rogers, H. Sharp, D. Benion. S.Holland, and T.Carey. Human Computer Interaction, Addison Wesley, 1994	
Websites	https://www.interaction-design.org/literature/topics/human-computer-interaction#:~:text=Human%2Dcomputer%20interaction%20(HCI)%20is%20a%20multidisciplinary%20field%20of,forms%20of%20information%20technology%20design.	

APPENDIX:

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

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

Ministry of Higher Education and
Scientific Research - Iraq
University of Babylon
College of Science for Women
Computer Science

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	Digital Image Processing	**Module Delivery**	
Module Type	ELECTIVE		Theory Lecture Seminar
Module Code	COM48039		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	4	**Semester of Delivery**	8
Administering Department	Computer science	**College**	College of Science for Women
Module Leader	Dr. Suhad Ahmed Ali	**e-mail**	wsci.suhad.ahmed@uobabylon.edu.iq
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name		**e-mail**	
Review Committee Approval	01/06/2023	**Version Number**	

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Linear algebra	**Semester**	4
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. The required objective from the student to pass course is to relies digital image techniques and it's important, as well as application fields. 2. The student should relies different types of processing on digital image 3. Development of student abilities to using available software in this field, in addition to the knowledge that acquire through processing of input image to computer 4. Develop the student ability to write program that represent certain process on image such as enhancement, Denoising.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	On successful completion of the course, the student will: • Be able to understand basic concepts image processing, image storage and types of transformations that can be applied to images. • Be able to compare the domains and methods of image processing. • Be able to check the correctness of algorithms using inductive proofs and loop invariants. • Learn Image Restoration & Enhancement techniques, color image processing. • Be able to make proper use of image processing tools.
Indicative Contents المحتويات الإرشادية	1. digital image représentions 2. Image types 3. Image file formats 4. basic relationship between image pixels 5. Arithmetic & Logical operation 6. Region of interest application 7. Image histogram 8. Quantization: spatial and gray levels 9. Image enhancement 10. Image sharpening 11. Image segmentation 12. Edge detection 13. Image compression

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	• Lectures will be conducted with the aid of multi-media projector, black board • Attendance is compulsory in lecture and laboratory which carries 5 marks in overall evaluation. • Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the overall internal evaluation

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 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	Motivation and Perspective, Computer imaging, categories of computer imaging, computer vision, image processing,
Week 2	Components of Image Processing System, Human Visual System (HVS), A Simple Image Model, Digitization, sampling, quantization
Week 3	Digital Image Definition, Representing Digital Images, Image Types, binary image, gray scale image, color image
Week 4	Digital Image File Format, Image analysis, Preprocessing: Region –of-Interest Image Geometry, Image Cropping, image zooming
Week 5	The Convolution Process: image zooming by convolution, K-Times zooming
Week 6	Image Shrinking: Averaging, Median , Decimation, Image Algebra, Arithmetic operations, Logic operations, Geometric Operations
Week 7	**Mid-Term Exam**
Week 8	Image quantization, Gray Level reduction (reduce pixel values themselves I(r, c), Image quantization by logical operations
Week 9	Image Histogram, Histogram Modifications, Histogram Stretch, Histogram shrink,

	Histogram Sliding.
Week 10	Histogram Equalization, Histogram features
Week 11	Edge Detection: Sobel Operator, Prewitt Operator, Kirch Compass Mask, Laplacian Operators
Week 12	What is noise? Noise types, Spatial masks, Noise Removal using Spatial Filters
Week 13	Mean filter, median filter, enhancement filters for noise removal
Week 14	Image Segmentation and most popular algorithm
Week 15	Image Segmentation and most popular algorithm
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to programming language (matlab)and learning matlab environment
Week 2	Review programming tools in image processing
Week 3	Writing program to loading, saving, and printing 256 gray scale image
Week 4	2D representation in matlab, Arrays, One-dimensional arrays (Vectors), Two dimensional arrays (Matrices), Array indexing
Week 5	Built-in MATLAB functions for arrays/matrices, Addition and subtraction, Multiplication, Division
Week 6	image zooming
Week 7	image shrinking
Week 8	**Mid-Term Exam**
Week 9	Image quantization
Week 10	Image histogram
Week 11	Image histogram operations
Week 12	Image histogram features
Week 13	Program to applied Histogram equalization
Week 14	Program to applied low pass filter , mean , median
Week 15	Program to edge detection using Prewitt, Kirch compassmask, Robinson Compass mask and Laplacian
Week 16	**Final exam**

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. S. Umbaugh," Computer Vision and Image Processing a practical approach using CVIP tools" , Prentice-Hall, Inc., Upper Saddle River, New Jersey, 1998. 2. Digital Image Processing, Second Edition by Rafel C. Gonzalez and Richard E. Woods, Pearson Education	
Recommended Texts	1. Digital Image Processing by Bhabatosh Chanda and Dwijesh Majumder, PHI. 2. Fundamentals of Digital Image Processing by Anil K Jain, PHI 3. Digital Image Processing Using Matlab, Rafel C. Gonzalez and Richard E. Woods, Pearson Educatio.	
Websites	John C. Russ, F. Brent Neal-The Image Processing Handbook, Seventh Edition, The Kindle edition (2016), CRC Press,Taylor & Francis Group.	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 – 100	Outstanding Performance
	B - Very Good	جيد جدا	80 – 89	Above average with some errors
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	D - Satisfactory	متوسط	60 – 69	Fair but with major shortcomings
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Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
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Note:				

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Ministry of Higher Education and
Scientific Research - Iraq
University of Babylon
College of Science for Women
Computer Science

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Computer Architecture	**Module Delivery**	
Module Type	CORE	Theory	
Module Code	COM2404	Lecture	
ECTS Credits	6	Seminar	
SWL (hr/sem)	100		
Module Level	2	**Semester of Delivery**	2
Administering Department	Computer Science	**College**	College of Science for Women
Module Leader	Salah Mahdi Saleh	**e-mail**	wsci.salah.alobaidi@uobabylon.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	PhD
Module Tutor	None	**e-mail**	None
Peer Reviewer Name		**e-mail**	
Review Committee Approval	20/01/2025	**Version Number**	1.0

Relation With Other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Identify some contributors to computer architecture and organization and relate their achievements to the knowledge area. 2. Articulate differences between computer organization and computer architecture. 3. Identify some of the components of a computer. 4. Explain the use of memory hierarchy to reduce the effective memory latency. 5. Explain how interrupts are used to implement I/O control and data transfers. 6. Be able to design an interface to memory 7. Understand how to interface and use peripheral chips 8. Discuss the generation of control signals using hardwired or microprogrammed implementations. 9. Explain basic instruction level parallelism using pipelining and the major hazards that may occur. 10. Discuss the concept of parallel processing beyond the classical von Neumann model
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Learning the basic concepts of computer architecture. 2. Learn the details of computer architecture types. 3. Understanding the memory addressing modes. 4. The student will be able to learn how the address is calculated. 5. The student will be able to know the memory architecture types and the difference among these types. 6. The student will be able to calculate the performance of processor.
Indicative Contents المحتويات الإرشادية	1. Introduction to Computer Architecture 2. Basic Computer Organization 3. Data Representation 4. Instruction Set Architecture (ISA) 5. CPU Design and Operation 6. Memory Hierarchy 7. Input/Output Systems 8. Parallel Processing 9. Performance Measurement and Optimization 10. Emerging Trends in Computer Architecture 11. Case Studies

<table>
<tr><td colspan="2" align="center">**Learning and Teaching Strategies**
استراتيجيات التعلم والتعليم</td></tr>
<tr><td>**Strategies**</td><td>1. Lectures
2. Discussion.
3. Interaction between the lecturer and the students by questions.
4. Google classroom.
5. Reports, Onsite Assignments, Quizzes, and Online Assignments.</td></tr>
</table>

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	45	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	10	10%(10)	2 to 11	10
	Online Assignment	3	10%(10)	7 and 9	3
	Onsite assignment	2	10%(10)	7 and 8	2
	Report	5	10%(10)	5 to 10	5
Summative assessment	Midterm Exam	2hr	10%(10)	12	2hr
	Final Exam	3hr	50% (50)	16	3hr
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Review of syllabus, Introduction to Computer Architecture. Computer Architecture and Computer Organization.
Week 2	Instruction Set Architecture (CISC and RISC)
Week 3	Classifying Instruction Set Architectures

Week 4	Memory Addressing: Interpreting Memory Addresses, Addressing Modes.
Week 5	Type and Size of Operands
Week 6	Design of CPU Control unit, Microprogrammed vs. Hardwired Control Unit
Week 7	Performance of processor
Week 8	Instruction Pipelining. Arithmetic Pipelining (Integer and Floating point Multiplication).
Week 9	Bus Interface, I/O channels, I/O processor
Week 10	Cache Organization and Operation, Cache references (Direct, Set Associative and Full Associative). Cache performance.
Week 11	Multiprocessor Architecture, Interprocessor Communication Networks
Week 12	**Mid exam**
Week 13	Cache Coherence
Week 14	Associative Memory, Content-Addressable Memories, Arithmetic in Memory
Week 15	Synchronization
Week 16	**Final exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	[1] J. L. Hennessy and D. A. Patterson, Computer Architecture : A Quantitative approach, 6th edition, Morgan Kaufmann Publishers Inc., 2019.	No
Recommended Texts	[2] D. M. Harris and S. L. Harris, Digital Design and Computer Architecture", 2nd edition, Elsevier Inc, 2013. [3] W. Stallings, Computer organization and architecture : designing for performance, 10th edition, 2016.	No
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 – 100	Outstanding Performance
	B - Very Good	جيد جدا	80 – 89	Above average with some errors
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Computer Science

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Programming Fundamentals	**Module Delivery**	
Module Type	CORE	Theory Lecture Seminar	
Module Code	UOBAB0604011		
ECTS Credits	8		
SWL (hr/sem)	200		
Module Level	1	**Semester of Delivery**	1
Administering Department	Computer Science	**College**	College of Science for Women
Module Leader	Hadeel Qasem Gheni	**e-mail**	wsci.hadeel.qasem@uobabylon.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	
Module Tutor			
Peer Reviewer Name	Majid Jabbar Jawad	**e-mail**	
Review Committee Approval	2023-11-05	**Version Number**	

<table>
<tr><td colspan="4" align="center">Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى</td></tr>
<tr><td>Prerequisite module</td><td></td><td>Semester</td><td></td></tr>
<tr><td>Co-requisites module</td><td></td><td>Semester</td><td></td></tr>
<tr><td colspan="4" align="center">Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية</td></tr>
<tr><td>Module Aims
أهداف المادة الدراسية</td><td colspan="3">After completion of this course, the students will be able to understand and explain the principles of the computer programming.</td></tr>
<tr><td>Module Learning Outcomes

مخرجات التعلم للمادة الدراسية</td><td colspan="3">Knowledge outcomes
1. The student can describe the algorithm.
2. The student can understand the nature of programming.
3. The student can describe programming languages
4. The student can write a programming code.</td></tr>
<tr><td>Indicative Contents
المحتويات الإرشادية</td><td colspan="3">1. Using smart screens in addition to regular blackboards.
2. Displaying the lecture on the university website as well as on the college and department website.
3. Focusing on discussion sessions between the lecturer and the students.
4. Encouraging self-learning and helping students to draw conclusions.
5. Emphasis on competition among students.</td></tr>
<tr><td colspan="4" align="center">Learning and Teaching Strategies
استراتيجيات التعلم والتعليم</td></tr>
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</table>

<table>
<tr><td colspan="4" align="center">Student Workload (SWL)
الحمل الدراسي للطالب</td></tr>
<tr><td>Structured SWL (h/sem)
الحمل الدراسي المنتظم للطالب خلال الفصل</td><td>3</td><td>Structured SWL (h/w)
الحمل الدراسي المنتظم للطالب أسبوعيا</td><td>3</td></tr>
<tr><td>Unstructured SWL (h/sem)
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<tr><td>Total SWL (h/sem)
الحمل الدراسي الكلي للطالب خلال الفصل</td><td colspan="3">73</td></tr>
</table>

Module Evaluation
تقييم المـادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	Continue	10	1	1
	Assignments	Continue	10	1	2
	Projects / Lab.	Continue	10	1	4
	Report	Continue	10	1	3
Summative assessment	**Midterm Exam**				
	Final Exam				
Total assessment			40		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Analysis the problem
Week 2	Understanding the algorithms and flowchart
Week 3	Introduction to C++
Week 4	Introduction to C++
Week 5	Understanding the variables declaration
Week 6	Understanding the reading and writing statement
Week 7	Understanding the reading and writing statement
Week 8	Understanding the single if statement
Week 9	Understanding the single if statement
Week 10	Test
Week 11	Understanding the if /else statement
Week 12	Understanding the if /else statement
Week 13	Understanding the if /else statement
Week 14	Understanding the if /else statement
Week 15	Test

	Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر
	Material Covered
Week 1	Understanding the operating system
Week 2	Understanding the C++ editor
Week 3	Understanding the C++ editor
Week 4	Understanding the C++ editor
Week 5	Understanding the variables declaration
Week 6	Understanding the reading and writing statement
Week 7	Understanding the reading and writing statement
Week 8	Practical Examples about the single if statement
Week 9	Practical Examples about the single if statement
Week 10	Test
Week 11	Practical Examples about if / else statement
Week 12	Practical Examples about if / else statement
Week 13	Practical Examples about if / else statement
Week 14	Practical Examples about if / else statement
Week 15	Test

	Learning and Teaching Resources مصادر التعلم والتدريس	
	Text	**Available in the Library?**
Required Texts	C++: The Complete Reference Third Edition by Herbert Schildt	
Recommended Texts	C++ Primer (5th Edition) 5th Edition by Stanley Lippman (Author), Josée Lajoie (Author), Barbara Moo (Author)	
Websites	https://www.w3schools.com/cpp/	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
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Computer Science

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Structured Programming	**Module Delivery**	
Module Type	CORE	Theory Lecture Seminar	
Module Code	UOBAB0604021		
ECTS Credits	8		
SWL (hr/sem)	200		
Module Level	1	**Semester of Delivery**	2
Administering Department	Computer Science	**College**	College of Science for Women
Module Leader	Hadeel Qasem Gheni	**e-mail**	wsci.hadeel.qasem@uobabylon.edu.iq
Module Leader's Acad. Title	Assist. Prof.	**Module Leader's Qualification**	
Module Tutor			
Peer Reviewer Name	Majid Jabbar Jawad	**e-mail**	
Review Committee Approval	2024-03-13	**Version Number**	

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module		Semester	
Co-requisites module		Semester	

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

Module Aims أهداف المادة الدراسية	After completion of this course, students will be able to explain the basic methods and conclusions of programming language through C++ programming and they will learn other programming languages easily.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Knowledge outcomes. 1. The student can write a computer program perfectly. 2. The student can choose the perfect choice depending on his knowledge. 3. The student can understand the logical relation between individual perfectly. 4. The student can operate with several items such array. 5. The student can build a small project. 6. The student can build user define function according to his requirements.
Indicative Contents المحتويات الإرشادية	The student can choose the perfect choice depending on his knowledge. 1. The student can understand the logical relation between individual perfectly. 2. The student can operate with several items such array. 3. The student can build a small project.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	1. Using smart screens in addition to regular blackboards. 2. Displaying the lecture on the university website as well as on the college and department website. 3. Focusing on discussion sessions between the lecturer and the students. 4. Encouraging self-learning and helping students to draw conclusions. 5. 5. Emphasis on competition among students.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	3	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

<table>
<tr><td colspan="6">Module Evaluation
تقييم المـادة الدراسية</td></tr>
<tr><td></td><td></td><td>Time/Number</td><td>Weight (Marks)</td><td>Week Due</td><td>Relevant Learning Outcome</td></tr>
<tr><td rowspan="4">Formative assessment</td><td>Quizzes</td><td>Continue</td><td>10</td><td>1</td><td>1</td></tr>
<tr><td>Assignments</td><td>Continue</td><td>10</td><td>1</td><td>1</td></tr>
<tr><td>Projects / Lab.</td><td>Continue</td><td>10</td><td>1</td><td>1</td></tr>
<tr><td>Report</td><td>Continue</td><td>10</td><td>1</td><td>1</td></tr>
<tr><td rowspan="2">Summative assessment</td><td>Midterm Exam</td><td>1</td><td></td><td></td><td></td></tr>
<tr><td>Final Exam</td><td>1</td><td></td><td></td><td></td></tr>
<tr><td colspan="3">Total assessment</td><td>40</td><td></td><td></td></tr>
</table>

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Understanding the While loop statement
Week 2	Understanding the Do - While loop statement
Week 3	Understanding the For-loop statement
Week 4	Understanding the Nested For loop statement
Week 5	Understanding the One-dimension array
Week 6	Understanding the One-dimension array
Week 7	Understanding the Two dimension array
Week 8	Understanding the Two dimension array
Week 9	Understanding the Two dimension array
Week 10	Understanding the Two dimension array
Week 11	Understanding the Function in C++
Week 12	Understanding the Function in C++
Week 13	Understanding the Function in C++
Week 14	Understanding the Function in C++
Week 15	Understanding the Function in C++

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Practical Examples about While loop statement
Week 2	Practical Examples about Do - While loop statement
Week 3	Practical Examples about For loop statement
Week 4	Practical Examples about Nested For loop statement
Week 5	Practical Examples about One dimension array
Week 6	Practical Examples about One dimensional array
Week 7	Practical Examples about Two-dimensional array
Week 8	Practical Examples about Two-dimensional array
Week 9	Practical Examples about Two-dimensional array
Week 10	Practical Examples about Two-dimensional array
Week 11	Practical Examples about Function in C++
Week 12	Practical Examples about Function in C++
Week 13	Practical Examples about Function in C++
Week 14	Practical Examples about Function in C++
Week 15	Practical Examples about Function in C++

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	C++: The Complete Reference Third Edition by Herbert Schildt	
Recommended Texts	Programming in CPP	
Websites	https://www.w3schools.com/cpp/	

APPENDIX:

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

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

Ministry of Higher Education and
Scientific Research - Iraq
University of Babylon
College of Science for Women
Computer Science

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		
Module Title	Embedded Systems	**Module Delivery**
Module Type	SUPLEMENT	Theory Lecture Seminar
Module Code	UOBAB0604065	
ECTS Credits	5	
SWL (hr/sem)	125	
Module Level	3	**Semester of Delivery**	6
Administering Department	Computer science	**College**	College of Science for Women
Module Leader	Dr. Wed K.AL-Sherefy	**e-mail**	wsci.wed.kadhum@uobabylon.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.
Module Tutor		**e-mail**	None
Peer Reviewer Name		**e-mail**	
Review Committee Approval	01/06/2024	**Version Number**	

Relation With Other Modules		
العلاقة مع المواد الدراسية الأخرى		
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This Embedded Systems course equips students with cutting-edge knowledge and practical skills to design, program, and optimize embedded systems for diverse applications. Combining theoretical foundations with hands-on implementation, the curriculum focuses on modern methodologies for creating efficient, reliable, and scalable embedded solutions—from hardware-software co-design to full System-on-Chip (SoC) development.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. **Comprehensive Knowledge of Embedded Systems Fundamentals**: Demonstrate a deep grasp of the scientific principles, theoretical frameworks, and technological foundations driving the field of Embedded Systems. 2. **Expertise in Modern Architectures**: Analyze state-of-the-art hardware/software architectures, their design trade-offs, and domain-specific implementations across automotive, IoT, industrial, and consumer electronics ecosystems. 3. **Proficiency in Design Methodologies**: Master established and emerging design methodologies for Embedded Systems, including model-based, component-driven, and platform-centric approaches. 4. **System-Level Design Techniques**: Apply system-level to implementation-phase design models, languages (e.g., UML, SysML), and tools (e.g., MATLAB/Simulink) to optimize functionality, performance, and resource constraints. 5. **Dependability-Centric Engineering**: Evaluate critical dependability requirements (safety, security, reliability) and integrate fault tolerance, verification, and validation strategies into all design phases. 6. **Practical Embedded Software Development**: Develop embedded software solutions using industry-standard tools (e.g., C/C++, RTOS, ARM Cortex-M), emphasizing hardware-software co-design, real-time constraints, and low-level optimization.
Indicative Contents المحتويات الإرشادية	
Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	Quizzes, practical test, writing essay, implement small projects, Read research papers and books

Student Workload (SWL)

الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	63	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 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	An Introduction to Embedded Systems
Week 2	Microcontroller Architecture and Programming
Week 3	Embedded Processor Architectures and Design
Week 4	EMBEDDED SYSTEM & GENERAL-PURPOSE COMPUTER
Week 5	The Memories In Embedded System
Week 6	SENSORS AND ACTUATORS
Week 7	Midterm Exam
Week 8	Device Drivers and Interrupts Interfacing
Week 9	External Devices Embedded System Design
Week 10	Development System-on-Chip (SoC) Design
Week 11	FPGA-Based System Design
Week 12	Internet of Things
Week 13	Embedded Systems for Automotive Applications
Week 14	Embedded Systems in Biomedical Applications

Week 15	Embedded Systems in Robotics
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to Embedded C Programming
Week 2	Introduction to Arduino Platform Programming
Week 3	Arduino – Program Structure and Data Type
Week 4	Arduino – LED Projects
Week 5	Arduino – Ultrasonic Range Finder
Week 6	Arduino – Digital Thermometer
Week 7	**Exam**
Week 8	Arduino – Robot1
Week 9	Arduino – Robot1
Week 10	Arduino – Voice-Controlled LED
Week 11	Arduino – People Counter
Week 12	Arduino – Building an RFID Tag Reader1
Week 13	Arduino – Building an RFID Tag Reader2
Week 14	ESP32 Publish Sensor Readings to ThingSpeak
Week 15	**Exam**

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Peter Marwedel" Embedded System Design Embedded Systems Foundations of Cyber-Physical Systems, and the Internet of Things ", Fourth Edition, 2021.	Soft copy
Recommended Texts	Peckol, J. (2019). *Embedded Systems* (2nd ed.). Wiley. Retrieved from https://www.perlego.com/book/991979/embedded-systems-a-contemporary-design-tool-pdf (Original work published 2019).	Soft copy
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
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Note:				

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Ministry of Higher Education and
Scientific Research - Iraq
University of Babylon
College of Science for Women
Computer Science

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		
Module Title	Software Engineering	**Module Delivery**
Module Type	SUPLEMENT	Theory Lecture Seminar
Module Code	UOBAB0604056	
ECTS Credits	5	
SWL (hr/sem)	125	

Module Level	3	**Semester of Delivery**	1
Administering Department	Computer	**College**	Sciw
Module Leader	Dr.Wed.K.Alsherefy	**e-mail**	wsci.wed.kadhum@uobabylon.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name		**e-mail**	
Review Committee Approval	01/06/2024	**Version Number**	

Relation With Other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Fundamental of Programming	**Semester**	1
Co-requisites module	Object Oriented	**Semester**	3

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. **Analyze the Software Development Lifecycle (SDLC)**: Identify and critically evaluate core phases of the SDLC (e.g., requirements analysis, design, implementation, testing, maintenance) and their role in delivering robust software solutions. 2. **Master Software Engineering Fundamentals**: Define and apply key terminology, principles, and paradigms (e.g., abstraction, modularity, version control) central to software engineering practice. 3. **Evaluate Interdisciplinary Connections**: Compare and contrast software engineering with related disciplines (e.g., Systems Engineering, Electrical/Computer Engineering) to understand collaborative workflows in complex technical projects. 4. **Develop Software with Industry Tools**: Modify or build functional software using modern tools/environments (e.g., Git, VS Code, Python/Java IDEs) to demonstrate proficiency in coding, collaboration, and version control. 5. **Diagnose and Debug Software Systems**: Troubleshoot defects in existing codebases using systematic debugging techniques (e.g., breakpoints, logging) and tools (e.g., debuggers, linters) to ensure functional correctness.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completing this course, students will be able to: 1. **Master Foundational Concepts**: Demonstrate knowledge of core software development principles, computing fundamentals, and key phases of the Software Development Lifecycle (SDLC), including requirements analysis, design, implementation, and testing methodologies. 2. **Evaluate Interdisciplinary Synergies**: Analyze the interplay between software engineering and related disciplines (e.g., Systems Engineering, Electrical/Computer Engineering, Industrial Engineering, Computer Science) to solve complex, cross-functional challenges. 3. **Develop and Validate Software Solutions**: Modify, extend, and test basic software programs using **VB.NET**, ensuring functional correctness through systematic debugging and validation frameworks (e.g., unit testing, regression testing). 4. **Assess Software Performance**: Critically evaluate the functionality, efficiency, and scalability of software applications using metrics, profiling tools, and optimization techniques. 5. **Critique Domain-Specific Applications**: Compare software solutions across diverse fields (public health, environmental sustainability, global economics) to assess how they address technical, ethical, and societal needs. 6. **Communicate Technical Concepts**: Articulate software engineering principles, design decisions, and project outcomes effectively through structured written reports and oral presentations tailored to technical and non-technical audiences.
Indicative Contents المحتويات الإرشادية	Plans for Algorithms, Code Verification, Code Validation, Code Testing, Cycle Development Feedback

<table>
<tr><td colspan="2">Learning and Teaching Strategies
استراتيجيات التعلم والتعليم</td></tr>
<tr><td>Strategies</td><td>Quizzes, Practical test, Writing Reports, Assignment Implementation</td></tr>
</table>

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
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Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
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	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	What is a software? Software product's types,The issues that affect in different software types, Software failure's types, and Software crises.
Week 2	What is software engineering? The importance of software engineering, The key challenges facing software engineering, Quality of professional software.
Week 3	The types of software systems? The fundamentals that can beapplied to software,The software engineer ethics.
Week 4	Introduction to software process, Waterfall model, Incremental development model, Reuse-oriented software engineering.
Week 5	Software specification, Software design and implementation.
Week 6	Software validation and verification, Software evolution .
Week 7	**Test**

Week 8	Change avoidance, Change tolerance
Week 9	Prototype model, Incremental model, Spiral model
Week 10	The principles of agile methods, Plan-driven and agile development
Week 11	Functional engineering requirements, Non-functional engineering requirements, Software requirements document? Users requirements document
Week 12	Ways of writing a system requirements specification, The development testing types
Week 13	The user testing types
Week 14	The system integration types
Week 15	The software quality types? Introduction to Software standards, Types Software metrics
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to the VB.Net environment, Program Structure Data Types, Variables, and Constant
Week 2	MessageBox and InputBox Functions, If Statement
Week 3	Select Case Statement, Go To Statement
Week 4	For Next, While Loops
Week 5	Label Tool andDate and Times
Week 6	RadioButton, CheckBox, ListBox and ComboBox Tools
Week 7	**Test**
Week 8	Strings and Arrays
Week 9	Functions and Subs
Week 10	One Way Traffic Light Project
Week 11	Calculator Project- Part1
Week 12	Calculator Project- Part2
Week 13	A Ring of Three Asynchronous Inverting Gates Project
Week 14	Daily reminder Poject-Part1
Week 15	Daily reminder Poject-Part2

<table>
<tr><td colspan="3" align="center">Learning and Teaching Resources
مصادر التعلم والتدريس</td></tr>
<tr><td></td><td align="center">Text</td><td align="center">Available in the Library?</td></tr>
<tr><td>Required Texts</td><td>Roger S. Pressman & Bruce R. Maxim, "Software Engineering: A Practitioner's Approach", 9 Edition, 2023.</td><td align="center">No</td></tr>
<tr><td>Recommended Texts</td><td>Robert C. Martin (Uncle Bob)"Clean Code: A Handbook of Agile Software Craftsmanship", 2 Edition, 2022.</td><td align="center">No</td></tr>
<tr><td>Websites</td><td colspan="2">http://www.pearsonhighered.com/sommerville/</td></tr>
</table>

APPENDIX:

<table>
<tr><td colspan="5" align="center">GRADING SCHEME
مخطط الدرجات</td></tr>
<tr><td>Group</td><td>Grade</td><td>التقدير</td><td>Marks (%)</td><td>Definition</td></tr>
<tr><td rowspan="5">Success Group (50 - 100)</td><td>A - Excellent</td><td>امتياز</td><td>90 – 100</td><td>Outstanding Performance</td></tr>
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<tr><td>Note:</td><td colspan="4"></td></tr>
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Ministry of Higher Education and
Scientific Research - Iraq
University of Babylon
College of Science for Women
Computer Science

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	English Language	**Module Delivery**	
Module Type		Theory	
Module Code		Lecture	
ECTS Credits		Seminar	
SWL (hr/sem)			
Module Level	3	**Semester of Delivery**	2
Administering Department	Computer	**College**	Computer Science for Women
Module Leader	Ghasaq Basim Abdulwahid	**e-mail**	ghasaq.kadhim.bscle@uobabylon.edu.iq
Module Leader's Acad. Title	Assist. lect	**Module Leader's Qualification**	
Module Tutor			
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval		**Version Number**	

<table>
<tr><td colspan="4" align="center">Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى</td></tr>
<tr><td>Prerequisite module</td><td>None</td><td>Semester</td><td></td></tr>
<tr><td>Co-requisites module</td><td>None</td><td>Semester</td><td></td></tr>
</table>

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

Module Aims أهداف المادة الدراسية	• بناء الاساس العلمي للطلبة في مجال اللغة الانكليزية و قواعدها • تدريب الطلبة على التقنيات الحديثة في اللغة الانكليزية • تعليم الطلبة على مواكبة التواصل للتطور الحاصل في هذا المجال • دراسة المفاهيم الاساسية وكيفية التحدث في اللغة الانكليزية • تعريف الطلاب على المبادئ الاساسية لبناء الجملة باللغة الانكليزية، العبارات واشباه الجمل وغيرها • معرفة الفرق بين أزمنة اللغة الانكليزية. • تطوير مهارات الكتابة والاصغاء لدى الطالب.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• تمكين الطالب من معرفة قواعد اللغة الانكليزية • حث الطلبة على الاستخدام الصحيح للقواعد ليتسنى لهم الكتابة بشكل صحيح • ربط المادة العلمية بمواد علمية خارجية ذات العلاقة للوصول الى الهدف والغاية من الدرس • اتقان استخدام مصطلحات معينة في القواعد
Indicative Contents المحتويات الإرشادية	• مشاركة الطلاب في الانشطة • مناقشة وحوار حول مفردات متعلقة بالموضوع

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	• طريقة القاء المحاضرات مدعم بالامثلة التفصيلية • تعمّد الخطأ! • Student center • المجاميع الطلابية (team project)

<table>
<tr><td colspan="4" align="center">Student Workload (SWL)
الحمل الدراسي للطالب</td></tr>
<tr><td>Structured SWL (h/sem)
الحمل الدراسي المنتظم للطالب خلال الفصل</td><td>100</td><td>Structured SWL (h/w)
الحمل الدراسي المنتظم للطالب أسبوعيا</td><td>2</td></tr>
<tr><td>Unstructured SWL (h/sem)
الحمل الدراسي غير المنتظم للطالب خلال الفصل</td><td></td><td>Unstructured SWL (h/w)
الحمل الدراسي غير المنتظم للطالب أسبوعيا</td><td></td></tr>
<tr><td>Total SWL (h/sem)
الحمل الدراسي الكلي للطالب خلال الفصل</td><td colspan="3">100</td></tr>
</table>

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	20		
	Assignments	2	10		
	Projects / Lab.				
	Report				
Summative assessment	**Midterm Exam**	2 hr	20		
	Final Exam	2 hr	50		
Total assessment			100 Marks		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	-It's a wonderful world -tenses
Week 2	Auxiliary verbs Pronouns and Contractions
Week 3	-What's in a word -Social expressions
Week 4	How to ask
Week 5	Present Simple and continuous
Week 6	Word formation Words that go together
Week 7	Adverbs and Adjectives short answers
Week 8	Parts of speech
Week 9	passive
Week 10	Sport and leisure Numbers and dates
Week 11	Article, preposition
Week 12	Questions and negatives
Week 13	Telling tales Giving opinion
Week 14	Past tense Simple and continuous

Week 15	preposition

<table>
<tr><td colspan="2">Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر</td></tr>
<tr><td></td><td>Material Covered</td></tr>
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<tr><td>Week 2</td><td></td></tr>
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<tr><td>Week 14</td><td></td></tr>
<tr><td>Week 15</td><td></td></tr>
</table>

<table>
<tr><td colspan="3">Learning and Teaching Resources
مصادر التعلم والتدريس</td></tr>
<tr><td></td><td>المصدر</td><td>Available in the Library?</td></tr>
<tr><td rowspan="2">Required Texts</td><td>Soars J., Soars L.(2009).New Headway. Intermediate. Student's Book's. Fourth Edition. Oxford university Press.</td><td rowspan="2">https://docs.google.com/forms/d/e/1FAIpQLSdOjWPC_YBfvtKqUTOY0pU1</td></tr>
<tr><td>Scrivener, Jim. (2010). Teaching English Grammar: what to teach and how to teach it. London: Macmillan Education</td></tr>
</table>

			AfGPBgmas9 1VMOoFeISn HYm_iQ/vie wform
Recommended Texts			
Websites			

APPENDIX:

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

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

Ministry of Higher Education and
Scientific Research - Iraq
University of Babylon
College of Science for Women
Computer Science

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	English Language		**Module Delivery**	
Module Type			Theory Lecture Seminar	
Module Code				
ECTS Credits				
SWL (hr/sem)				
Module Level		4	**Semester of Delivery**	2
Administering Department		Computer	**College**	Computer Science for Women
Module Leader		Ghasaq Basim Abdulwahid	**e-mail**	ghasaq.kadhim.bscle@uobabylon.edu.iq
Module Leader's Acad. Title		Assist. lect	**Module Leader's Qualification**	
Module Tutor				
Peer Reviewer Name		none	**e-mail**	none
Review Committee Approval			**Version Number**	

<table>
<tr><td colspan="3" align="center">**Relation With Other Modules**
العلاقة مع المواد الدراسية الأخرى</td></tr>
<tr><td>**Prerequisite module**</td><td>None</td><td>**Semester**</td><td></td></tr>
<tr><td>**Co-requisites module**</td><td>None</td><td>**Semester**</td><td></td></tr>
</table>

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

Module Aims أهداف المادة الدراسية	• بناء الاساس العلمي للطلبة في مجال اللغة الانكليزية و قواعدها • تدريب الطلبة على التقنيات الحديثة في اللغة الانكليزية • تعليم الطلبة على مواكبة التواصل للتطور الحاصل في هذا المجال • دراسة المفاهيم الاساسية وكيفية التحدث في اللغة الانكليزية • تعريف الطلاب على المبادئ الاساسية لبناء الجملة باللغة الانكليزية، العبارات واشباه الجمل وغيرها
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• تمكين الطالب من معرفة قواعد اللغة الانكليزية • حث الطلبة على الاستخدام الصحيح للقواعد ليتسنى لهم الكتابة بشكل صحيح • ربط المادة العلمية بمواد علمية خارجية ذات العلاقة للوصول الى الهدف والغاية من الدرس • اتقان استخدام مصطلحات معينة في القواعد
Indicative Contents المحتويات الإرشادية	• مشاركة الطلاب في الانشطة • مناقشة وحوار حول مفردات متعلقة بالموضوع

Learning and Teaching Strategies استراتيجيات التعلم والتعليم

Strategies	• طريقة القاء المحاضرات • تعمّد الخطأ! • Student center • المجاميع الطلابية (team project)

Student Workload (SWL) الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	100	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	No place like home The tense system
Week 2	Pronouns and Contractions
Week 3	Compound words
Week 4	How to ask
Week 5	Been there, done that Present perfect Simple and continuous
Week 6	Hot verbs – make, do
Week 7	Adverbs and Adjectives short answers
Week 8	Past tense Simple and continuous
Week 9	Parts of speech
Week 10	Phrasal verbs
Week 11	Past perfect Simple and continuous
Week 12	What a story Article, preposition
Week 13	Quantifiers / Quantity words and expressions
Week 14	Questions and negatives
Week 15	Prefixes and antonyms

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		
	المصدر	**Available in the Library?**
Required Texts	Soars J., Soars L.(2014).New Headway. Upper-Intermediate. Student's Book's. Fourth Edition. Oxford university Press.	
	Scrivener, Jim. (2010). Teaching English Grammar: what to teach and how to teach it. London: Macmillan Education	https://docs. google.com/f orms/d/e/1 FAIpQLSdOj WPC_YBfvtK qUTOY0pU1 AfGPBgmas9

		1VMOoFeISnHYm_iQ/viewform
Recommended Texts		
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 – 100	Outstanding Performance
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Ministry of Higher Education and
Scientific Research - Iraq
University of Babylon
College of Science for Women
Computer Science

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	Mobile's Applications		Module Delivery	
Module Type	ELECTIVE		**Theory**	
Module Code			**Lecture**	
ECTS Credits	5		**Seminar**	
SWL (hr/sem)	125			
Module Level	8	**Semester of Delivery**		2
Administering Department	Computer Science	**College**	Sciw	
Module Leader	Zahraa Jabbar Hussein	**e-mail**	zahraa.jabbar@uobabylon.edu.	
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**		Lecture. Dr
Module Tutor	None	**e-mail**	None	
Peer Reviewer Name		**e-mail**		
Review Committee Approval	01/06/2023	**Version Number**		

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None		Semester	

Co-requisites module	None		**Semester**	Second

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

Module Aims أهداف المادة الدراسية	The main goal of this course is to provide students with the knowledge and practical skills necessary to develop mobile applications for various smartphone operating systems, with a focus on Android. By the end of this module, students will be able to: 1. Understand the types of applications available for different smartphone operating systems (such as Android and iOS). 2. Develop native Android applications using appropriate programming tools and become familiar with essential libraries and how to use them effectively. 3. Apply concepts of activity linking and interaction within mobile apps. 4. Acquire practical programming skills that qualify them for employment in the mobile app development industry.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of this module, students will be able to: 1. **Understand Mobile Application Development** Gain a comprehensive understanding of mobile app development principles, including mobile platform architecture, application components, and the development lifecycle. 2. **Demonstrate Proficiency in Mobile Programming Languages and Frameworks** Develop skills in using programming languages such as Java, Kotlin (for Android), and frameworks like Flutter. 3. **Design Effective User Interfaces and Experiences (UI/UX)** Apply UI/UX principles to create intuitive, attractive, and user-friendly mobile app interfaces. 4. **Implement Core Mobile App Functionalities** Build apps with features such as data storage, networking, multimedia, location services, and notifications. 5. **Ensure Mobile App Security** Apply best practices for secure storage, user authentication, and data communication in mobile apps. 6. **Conduct Testing and Debugging** Use appropriate tools and methodologies to test and debug mobile applications for quality and reliability. 7. **Deploy and Distribute Mobile Applications** Understand how to package, sign, and publish apps to platforms like Google Play, following guidelines and requirements. 8. **Optimize Mobile App Performance** Identify and resolve performance issues related to memory, network usage, and battery consumption. 9. **Collaborate Effectively on Projects**

	Work in teams using version control systems and basic project management principles.
Indicative Contents المحتويات الإرشادية	This course covers the following core topics to guide students through the development of modern, functional, and secure mobile applications: 1. **Introduction to Mobile Application Development** Overview of mobile platforms (Android, iOS), development frameworks, and the mobile app development lifecycle. 2. **User Interface Design for Mobile Applications** Principles of UI/UX design, creating responsive and adaptive layouts, and ensuring accessibility. 3. **Mobile Programming Languages and Frameworks** Introduction to Java and Kotlin for Android, Swift for iOS, and cross-platform development using Flutter or React Native. 4. **Data Storage and Management** Techniques for local data storage (e.g., SQLite, SharedPreferences), cloud-based storage (Firebase), and real-time synchronization. 5. **Networking and Web Services** Handling network communication, making HTTP requests, parsing JSON/XML data, and consuming RESTful APIs. 6. **Multimedia Integration** Implementing features for capturing and displaying images, recording and playing audio/video, and camera access. 7. **Mobile App Security** Introduction to secure coding practices, user authentication, secure data handling, and protecting against common threats.

<table>
<tr><td colspan="2" align="center">Learning and Teaching Strategies
استراتيجيات التعلم والتعليم</td></tr>
<tr><td>Strategies</td><td>To ensure effective delivery of the course content and active student engagement, the following strategies will be adopted:
1. Using Smart Screens and Traditional Whiteboards
Smart technologies will be integrated alongside conventional methods to enhance the learning experience.
2. Providing Online Access to Lecture Materials
Lecture notes and materials will be made available on the college's website and learning platforms
3. Encouraging Interactive Discussions
Active discussions between the instructor and students will be promoted to reinforce understanding.
4. Promoting Self-Learning and Critical Thinking
Students will be encouraged to explore topics independently and draw their own conclusions.
5. Assigning Projects and Activities with Graded Evaluation
Students will complete assignments and activities that contribute to their final grade.</td></tr>
</table>

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.8125
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	2, 11	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	3, 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)	8,14	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Android, entry strategies into the mobile field, and advantages of adopting Android.
Week 2	What is an operating system? Overview of Android OS versions.
Week 3	Activities: Purpose and interaction with the user.
Week 4	Screen orientation handling in Android and its importance in modern smartphones.
Week 5	Designing the application user interface (UI).
Week 6	Using AutoCompleteTextView for assisting user input.
Week 7	Drawables, Styles, and Themes in Android.
Week 8	**Midterm Exam 1**
Week 9	Understanding Styles: Features that define look and presentation.

Week 10	Messaging and Networking: Sending SMS and app-to-app communication.
Week 11	Sending Emails: Configuring email with POP3 or IMAP.
Week 12	Connecting to the Internet: Network security and making API/network calls.
Week 13	Data Storage with SQLite, using Content Providers, and implementing CRUD operations.
Week 14	**Midterm Exam 2**
Week 15	General review and preparation for final exam
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Setting up the Android Studio Environment
Week 2	Creating a Kotlin Project and Running it on an Emulator/Device
Week 3	Exploring Basic Kotlin Syntax and Concepts
Week 4	Building a Simple Kotlin Android App
Week 5	Implementing UI Components and Layouts in Kotlin
Week 6	Handling User Input and Event Handling with Kotlin
Week 7	Building Multiple Activities and Navigating Between Them
Week 8	**Midterm Lab Exam 1**
Week 9	Using Content Providers for Data Access in Kotlin
Week 10	Networking with Retrofit in Kotlin
Week 11	Implementing RecyclerView and Adapter in Kotlin
Week 12	Background Processing and Implementing Services in Kotlin
Week 13	Applying Material Design Guidelines and UI Styling in Kotlin
Week 14	Unit Testing and Debugging Kotlin Apps in Android Studio
Week 15	**Midterm Lab Exam 2**
Week 16	Final Lab Exam

<table>
<tr><td colspan="3" align="center">Learning and Teaching Resources
مصادر التعلم والتدريس</td></tr>
<tr><td></td><td align="center">Text</td><td align="center">Available in the Library?</td></tr>
<tr><td>Required Texts</td><td></td><td></td></tr>
<tr><td>Recommended Texts</td><td>1. Programming with Mobile Applications: Android™, iOS, and Windows Phone by Thomas J. Duffy | Feb 6, 2012
2. Programming Kotlin: Create Elegant, Expressive, and Performant JVM and Android Applications
By Venkat Subramaniam | Oct 1, 2019</td><td></td></tr>
<tr><td>Websites</td><td colspan="2" align="center">Website: https://developer.android.com/</td></tr>
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<table>
<tr><td colspan="5" align="center">GRADING SCHEME
مخطط الدرجات</td></tr>
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<tr><td colspan="2">Note:</td><td colspan="3"></td></tr>
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Ministry of Higher Education and
Scientific Research - Iraq
University of Babylon
College of Science for Women
Computer Science

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		

Module Title	Scientific Research Methodology	Module Delivery	
Module Type		**Theory** **Lecture** **Seminar**	
Module Code			
ECTS Credits			
SWL (hr/sem)			

Module Level		Semester of Delivery	1
Administering Department	Computer	College	Computer Science for Women
Module Leader		e-mail	zahraa.jabbar@uobabylon.edu.
Module Leader's Acad. Title		Module Leader's Qualification	Lecture. Dr
Module Tutor			
Peer Reviewer Name		e-mail	
Review Committee Approval		Version Number	

Relation With Other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		**Semester**	first
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The aim of this course is to equip students with the essential knowledge and skills required to conduct scientific research systematically and ethically. It focuses on building the student's ability to understand research concepts, formulate research problems, design studies, collect and analyze data, and present findings clearly and accurately. 1. To introduce students to the principles and types of scientific research. 2. To develop students' skills in identifying and formulating research problems. 3. To familiarize students with research design, sampling techniques, and data collection methods. 4. To enable students to analyze data using appropriate scientific tools. 5. To train students in writing research proposals and final research reports. 6. To instill ethical standards and academic integrity in research.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of this module, students will be able to: 1. **Understand the Fundamentals of Scientific Research:** Identify different types, methods, and purposes of scientific research. 2. **Define and Formulate Research Problems:** Clearly define a research problem and develop relevant research questions or hypotheses. 3. **Design Research Methodologies:** Select appropriate research designs, sampling techniques, and tools for data collection. 4. **Collect and Analyze Data:** Use qualitative or quantitative methods to gather and analyze data systematically. 5. **Evaluate Sources and Conduct Literature Review**: Search for, evaluate, and integrate academic sources to support research. 6. **Apply Ethical Standards in Research:** Demonstrate awareness of ethical considerations in conducting and reporting research. 7. **Develop Research Proposals and Reports**: Write structured and coherent research proposals and final reports. 8. **Present Research Findings Effectively**: Communicate research outcomes clearly through oral presentations and written formats.
Indicative Contents المحتويات الإرشادية	1. **Introduction to Scientific Research**: Definition, scope, and importance of scientific research. 2. **Research Methods and Approaches**: Qualitative vs. quantitative research methods. 3. **Identifying Research Problems**: Formulation of research questions and hypotheses. 4. **Literature Review and Resource Evaluation**: Conducting a literature

	review and critical evaluation of sources.
	5. **Research Design and Methodology**: Types of research designs: Experimental, non-experimental, and exploratory.
	6. **Sampling Techniques**: Types of sampling methods: Probability and non-probability sampling.
	7. **Data Collection Methods**: Surveys, interviews, questionnaires, and observation.
	8. **Data Analysis Techniques**:
	• Statistical analysis for quantitative research.
	• Thematic and content analysis for qualitative research.
	9. **Research Ethics and Integrity**: Ethical issues in research: Informed consent, privacy, and confidentiality.
	10. **Writing Research Proposals and Reports**: Structure and components of research proposals and final reports.
	11. **Presenting Research Findings**: Writing and presenting research findings effectively.
	12. **Review of Research Methodologies**: Comparison and evaluation of different research methods and methodologies.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	

Strategies	1. **Interactive Lectures and Discussions**
	    o Lectures will be interactive, encouraging student participation through discussions, questions, and problem-solving activities.
	
	 2. **Case Studies and Real-Life Examples**
	    o Case studies from various fields will be used to demonstrate the application of research methodologies in real-world scenarios.
	
	 3. **Group Work and Collaborative Learning**
	    o Students will be divided into groups for collaborative learning, promoting teamwork and peer feedback during research proposal development and problem-solving activities.
	
	 4. **Self-Directed Learning**
	    o Students will be encouraged to explore additional resources beyond class materials, such as academic papers, research articles, and online databases, to foster independent learning.
	
	 5. **Hands-On Practical Sessions**
	    o Practical sessions focusing on data collection, analysis, and writing research reports will allow students to apply their theoretical knowledge to real research tasks.

6. **Formative Assessments and Feedback**
   o Regular quizzes, assignments, and presentations will provide ongoing feedback to help students assess their understanding and improve their skills throughout the course.
7. **Use of Digital Resources and Research Tools**
   o Online platforms, academic databases, and research tools (e.g., reference management software) will be integrated into the course to enhance students' research capabilities.
8. **Research Proposal Development**
   o Students will work on developing their research proposals, including selecting research topics, framing research questions, and justifying their methodology choices.
9. **Peer Review and Critique**
   o Peer review exercises will help students refine their research proposals and reports by providing constructive feedback on each other's work.
10. **Lecturer-Led Guidance and Mentorship**
    o Lecturers will provide one-on-one mentorship for students, guiding them through the process of designing and conducting their research projects.

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

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10%(10)	2, 11	
	Assignments	5	10%(10)	3, 12	

					Continuous	
	Projects / Lab.				Continuous	
	Report	1	10%(10)		13	
Summative assessment	**Midterm Exam**	2hr	20%(20)		8,14	
	Final Exam	3hr	50% (50)		16	
Total assessment			100% (100 Marks)			

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Scientific Research: Definition, objectives, and importance
Week 2	Types and Classifications of Scientific Research
Week 3	Research Problems: Identifying and formulating a research problem
Week 4	Literature Review: Purpose, techniques, and source evaluation
Week 5	Research Hypotheses and Variables: Types, roles, and formulation
Week 6	Research Design and Methodology
Week 7	Sampling Techniques: Probability and non-probability sampling
Week 8	**Midterm Exam1**
Week 9	Data Collection Methods: Surveys, interviews, observations, and tools
Week 10	Data Analysis Methods: Quantitative and qualitative techniques
Week 11	Research Ethics: Ethical considerations, plagiarism, and integrity
Week 12	Writing a Research Proposal: Structure and key components
Week 13	• Research Report Writing: Formatting, referencing, and academic style • Presenting Research Findings: Techniques and tools
Week 14	**Midterm Exam2**
Week 15	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		
Recommended Texts	Ranjit Kumar, Research Methodology: A Step-by-Step Guide for Beginners 5th Edition , SAGE Publications Ltd; 5th edition, February 11, 2019, ISBN-10 : 1526449900.	
Websites	Amazon.com: Ranjit Kumar: books, biography, latest update	

APPENDIX:

<table>
<tr><td colspan="5" align="center">GRADING SCHEME
مخطط الدرجات</td></tr>
<tr><td>Group</td><td>Grade</td><td>التقدير</td><td>Marks (%)</td><td>Definition</td></tr>
<tr><td rowspan="5">Success Group
(50 - 100)</td><td>A - Excellent</td><td>امتياز</td><td>90 – 100</td><td>Outstanding Performance</td></tr>
<tr><td>B - Very Good</td><td>جيد جدا</td><td>80 – 89</td><td>Above average with some errors</td></tr>
<tr><td>C –Good</td><td>جيد</td><td>70 – 79</td><td>Sound work with notable errors</td></tr>
<tr><td>D - Satisfactory</td><td>متوسط</td><td>60 – 69</td><td>Fair but with major shortcomings</td></tr>
<tr><td>E - Sufficient</td><td>مقبول</td><td>50 – 59</td><td>Work meets minimum criteria</td></tr>
<tr><td rowspan="2">Fail Group
(0 – 49)</td><td>FX – Fail</td><td>مقبول بقرار</td><td>(45-49)</td><td>More work required but credit awarded</td></tr>
<tr><td>F – Fail</td><td>راسب</td><td>(0-44)</td><td>Considerable amount of work required</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="2">Note:</td><td></td><td></td><td></td></tr>
<tr><td colspan="5"></td></tr>
</table>

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي