



University of Babylon

College of Science for Women

Department of Computer Science

***Academic Program Description
for Undergraduate Studies
Department of Computer science
for the Year
2024-2025***



Academic Program Description Form

University Name: University of Babylon

College/Institute: College of Science for Women

Name of the academic: Bachelor's in Computer Science

Name of final degree: Bachelor's in Computer Science

Study system: Undergraduate Studies/course system

Description preparation date: 10/10/2024

Date of filling out the file: 16/10/2024

Signature:

Name of Department Head

Dr. Saif Mahmoud Khalaf

Date: 16 / 10 / 2024

Signature:

Name of Scientific Assistant

Dr. Kawthar Mohammed Ali

Date: 16 / 10 / 2024

The file is checked by

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Mohammed J.Jader

Date: 16 / 10 / 2024



Approval of the Dean

Introduction to the Academic Program Description

The Department of Computer Science is one of the main departments in the College of Science, encompassing a number of diverse scientific disciplines, including communications, computer networks, artificial intelligence, and cybersecurity. The Department of Computer Science is of great importance due to its influential role in supplying the labor market with programmers and software developers. Therefore, it has the highest priority in keeping pace with the latest developments in the field of information technology.

The department currently offers three programs (Bachelor's, Higher Diploma, Master's) in Computer Science. The Department of Computer Science is committed to meeting all quality standards to prepare, qualify, and graduate a cadre capable of performing their scientific and educational professions with competence and excellence. The department is also committed to continuously developing its curricula and teaching staff in line with the curricula of international universities. The development of software has opened up broad horizons for the employment of information technology in all scientific and applied fields. The use of information technology has increased the efficiency and accuracy of work, while reducing human effort through the use of computer software.

The curriculum is subject to periodic review to ensure its alignment with international academic standards and labor market developments. It includes field training opportunities, giving graduates a competitive advantage in the workplace or for pursuing graduate studies at the world's most prestigious universities.

1. Program Vision

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.

2. Program Mission

The program's mission is to present a generation of graduates to society who have the scientific capabilities and expertise that enable them to contribute to building and developing a labor market based on the use of the best and most modern scientific and technological techniques to serve society.

3. Program Objectives

The Department of Computer Science at the College of Science for Girls aims to supply the labor market with a proportion of its need for programmers and developers of software and applications at various applied levels, in addition to constantly striving to keep pace with scientific and technological development, which is 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) through its researchers presenting 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 accelerate progress in this field.

4. Programmatic Accreditation

Nothing

5. Other External Influences

Association Collegiate School of Business(AACSB)

6. Program Structure

Distribution of units across study stages and the percentages of departmental requirements (mandatory or elective), college, and university requirements were as follows:

Stage	Number of Units	Core (Mandatory)	Elective	Supported
First	30	19	0	11
Second	41	24	15	2
Third	39	27	9	3
Fourth	35	19	14	2
Total	145	89	38	18
Percentage		61.4%	26.2%	12.4%

7. Program Description :: Note: Stage 1 + 2 (Bologna Route)

Year/level	course code	Name of the course	Credit hours	
			Theoretical	Practical
The third stage Course (1)	C13	Language Translator (1)	2	2
	C19	Artificial Intelligence	2	2
	C10	Algorithms Design and Analysis (1)	2	2
	C18	Computer Graphics	2	2
	C20	Computer Networks (1)	2	2
	C15	Software Engineering	2	2
	S7	Scientific Research Methodology	2	
The third stage Course (2)	C14	Language Translator (2)	2	2
	E22	Machine Learning	2	2
	C10	Algorithms Design and Analysis (2)	2	2
	E60	Embedded Systems	2	2
	C20	Computer Networks (2)	2	2
	E56	Parallel Computing	2	2

	S5	English Language (3)	2	-
The fourth stage Course (1)	C21	Operating Systems (1)	2	2
	C23	Computing Security (1)	2	2
	C28	Human Computer Interaction	3	-
	C29	Graduate Project	1	2
	E54	Evolutionary Computing	2	2
	E20	Coding and Data Compression	2	-
The fourth stage Course (2)	C22	Operating Systems (2)	2	2
	C24	Computing Security (2)	2	2
	E10	Digital Image Processing	2	2
	C29	Graduate Project	1	-
	E47	Multi-agent Systems	2	2
	E59	Mobile's Applications Programming	2	2
	S6	English Language (4)	2	-

8. The expected learning outcomes of the program

Knowledge

Knowledge and Understanding

- 1- To recognize the nature of laser rays.
- 2- To recognize the types of laser beams.
- 3- To be able to use different types of lasers in applications.
- 4- To analyze laser device systems.
- 5- To evaluate the feasibility and cost of using lasers in medicine and industry.

Skills

Subject-Specific Skills

- 1 - The student's knowledge of the physical nature of the laser beam.
- 2 - The student's ability to deal with laser beams and laser systems.
- 3- Enabling students to analyze the quality of uses of laser rays in medicine and industry.
- 4- Reviews of industrial quality measurement analysis systems in the use of lasers.

Thinking Skills

- 1 - Thinking skill according to ability. The goal of this skill is for the student to believe in what is tangible (the student's abilities) and understand when, what and how he should think and work to improve the ability to think reasonably.
- 2- High thinking skill (the goal of this skill is to teach thinking well before making the decision that determines the student's life)

Ethics

Evaluation methods

- 1- Exams
- 2- Learning Matrix
- 3- Which Face
- 4- CAT (student feedback)
- 5- Learning Triangle

9. Teaching and Learning Strategies

Learning strategies

- 1-Thinking strategy according to the student's ability (for example: if the student is able to learn the correct concept of management, he will acquire the skill of managing and organizing his personal life).
- 2- High thinking skill strategy (for example, if the student wants to make a good decision, it is important that he thinks well before he makes the decision, and if he decides without thinking, or if he cannot think well, or if he cannot decide, or perhaps he will not decide, then this This means he does not have high thinking skills.)
- 3- Critical thinking strategy in learning (Critical Thanking) (It is a term that symbolizes the highest levels of thinking, which aims to pose a problem and then analyze it logically to reach the desired solution).
- 4-Brainstorming

Methods of teaching and learning

- 1- Method of giving lectures.
- 2- Student Center
- 3- Student groups
- 4- 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

1- Exams

2- Learning Matrix

3- Which Face

4- CAT (student feedback)

5- Learning Triangle

11. Faculty

Faculty Members

<i>Academic Rank</i>	<i>Instructor's name</i>	<i>Specialization</i>		<i>Special Requirements/skills (it applicable)</i>	<i>Number of the teaching staff</i>	
		<i>General</i>	<i>Special</i>		<i>staff</i>	<i>Lecturer</i>
Professor	Dr. Hussein Attia Lafta	Computer	Artificial Intelligence		√	
Professor	Dr. Suhad Ahmed Ali	Computer	Artificial Intelligence		√	

Professo r	Dr. Majid Jabbar Jawad	computer	security and information processing		√	
Professo r	Dr . Samaher Hussein Ali	Computer	Artificial Intelligence		√	
Professo r	Dr. Samah Abdel Hadi Abbas,	Mathematics	Mathematics		√	
Professo r	Dr Muhammad Abdullah Nasser	Computer	security and information processing		√	
Professo r	Dr. Sahar Adel Kazem	Computer	Security and information		√	
Professo r	Dr. Israa Hadi Obaid,	Computer	Translators and Computational Theory		√	
Assistant Professo r	Dr. Saif Mahmoud,	Computer	computer networks		√	
Professo r	Dr. Mahdi Abdel Salman	Computer	Distributed Systems		√	
Professo r	Dr. Muhammad Obaid	Computer	Information Technology/Sof tware		√	
Assistant	Dr. Salah Mahdi Saleh	Computer	Timbers Patterns		√	
Professo r	Dr. Ahmed Badri Muslim,	Computer	Parallel Algorithms		√	
Assistant Professo r	Dr.Ali Yaqoub Youssef	Computer	artificial intelligence		√	
Assistant Professo r	Dr. Ali Kazem Muhammad	Computer	Information Technology/Sof tware		√	

Teacher	Dr . Farah Muhammad Hassan,	Computer	information security		√	
Teacher	Dr. wed Kazem Aliwi	Computer	Computer		√	
Assistant Professo r	Dr. Ahmed Mohamed Hussein,	Computer	Computer		√	
Assistant Professo r	Dr.. Zainab Abdel Moneim Abdel Hadi,	Mathematics	Functional Approximation Theory		√	
Teacher	Zainab Falah Hassan	Computer	Computer		√	
Assistant Professo r	Dr. Elaf Ali Abboud	Computer	Computer		√	
Teacher	Noor Kazem Ayoub	Computer	Computer		√	
Assistant Professo r	Asraa Abdullah Hussein	Computer	Computer		√	
Teacher	Russell Muhammad Nimah	Computer	Computer		√	
Teacher	Dr. 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		√	
teacher	Shaima Abdel Kazem Hadi	Computer	Computer		√	
assistant teacher	Zahraa Aboud Ahmed	Computer	Computer		√	
assistant teacher	Rafif Mazhar Katran	Computer	Computer		√	

Professional Development

Mentoring new faculty members

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

- 1- Directing and guiding learners by creating educational situations that lead to desirable activities.
- 2- Providing an atmosphere of love, kindness and cooperation between the teacher and the learners and between the learners themselves through his love for his students without discrimination and not excessive feminization.
- 3- Adopting democratic leadership through the emotional 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.

Professional development for faculty members

- 1- Thinking strategy according to the student's ability (for example: if the student is able to learn the correct concept of management, he will acquire the skill of managing and organizing his personal life). And the high thinking skill strategy (for example, if the student wants to make a good decision, it is important that he thinks well before he makes

the decision, and if he decides without thinking or if he cannot think well or if he cannot decide or perhaps he will not decide, this means He does not have high thinking skills.)

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 for solving the problem).

12. Acceptance criterion

Central acceptance and parallel acceptance

13. The most important sources of information about the program

4- 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

5- University guide <https://systems.uobabylon.edu.iq/>

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

14. Program development plan

The Bologna Process was applied to the students of the first stage, and work is being done to apply it to the next stages, along with conducting workshops and seminars to familiarize faculty members with the requirements of the Bologna Process and how to work with it, and to discuss the negatives

and obstacles and find solutions for them. The electronic system was applied in the education process.

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			
				<i>A₁</i>	<i>A₂</i>	<i>A₃</i>	<i>A₄</i>	<i>B₁</i>	<i>B₂</i>	<i>B₃</i>	<i>B₄</i>	<i>C₁</i>	<i>C₂</i>	<i>C₃</i>	<i>C₄</i>	<i>D₁</i>	<i>D₂</i>	<i>D₃</i>	<i>D₄</i>
The third stage Course (1)	C13	Language Translator (1)	Core	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	C19	Artificial Intelligence	Core	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	C10	Algorithms Design and Analysis (1)	Core	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	C18	Computer Graphics	Core	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	C20	Computer Networks (1)	Core	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	C15	Software Engineering	Core	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	S7	Scientific Research Methodology	Supported	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

[illegible]

	S5	English Language (3)	Supported																	
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<i>Program skills Outline</i>																			
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				<i>Required program learning outcomes</i>															
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<i>Year /Level</i>	<i>Course Code</i>	<i>Course Name</i>	<i>Basic or optional</i>	<i>Knowledge</i>				<i>Skills</i>				<i>Ethics</i>				<i>Other skills related to employability and personal development</i>			
				<i>A₁</i>	<i>A₂</i>	<i>A₃</i>	<i>A₄</i>	<i>B₁</i>	<i>B₂</i>	<i>B₃</i>	<i>B₄</i>	<i>C₁</i>	<i>C₂</i>	<i>C₃</i>	<i>C₄</i>	<i>D₁</i>	<i>D₂</i>	<i>D₃</i>	<i>D₄</i>
The fourth stage Course (1)	C21	Operating Systems (1)	Core	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	C23	Computing Security (1)	Core	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	C28	Human Computer Interaction	Core	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	C29	Graduate Project	Core	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	E54	Evolutionary Computing	Elective	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

		E20	Coding and Data Compression	Elective	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
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	<i>Program skills Outline</i>																			
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					<i>Required program learning outcomes</i>															
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<i>Year /Level</i>	<i>Course Code</i>	<i>Course Name</i>	<i>Basic or optional</i>	<i>Knowledge</i>				<i>Skills</i>				<i>Ethics</i>				<i>Other skills related to employability and personal development</i>			
				<i>A₁</i>	<i>A₂</i>	<i>A₃</i>	<i>A₄</i>	<i>B₁</i>	<i>B₂</i>	<i>B₃</i>	<i>B₄</i>	<i>C₁</i>	<i>C₂</i>	<i>C₃</i>	<i>C₄</i>	<i>D₁</i>	<i>D₂</i>	<i>D₃</i>	<i>D₄</i>
The fourth stage Course (2)	C22	Operating Systems (2)	Core	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	C24	Computing Security (2)	Core	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	E10	Digital Image Processing	Elective	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	C29	Graduate Project	Core	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	E47	Multi-agent Systems	Elective	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

		E59	Mobile's Applications Programming	Elective	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
		S6	English Language (4)	Supported																



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	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	

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- التعرف على بنية نظام التشغيل والهيكل 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 بإدارة البيانات. 6- دراسة طرق ربط ايعازات النظام مع لغة البرمجة لتوليد برامج لها قابلية اكبر من الايعازات الموجودة بالنظام لإدارة الملفات والبيانات كحزمة واحدة.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	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 لتنظيم الملفات بطرق عدة. 4. التعرف على طرق تنصيب وازالة البرامج الخدمية من والى النظام . 5. تعلم طرق برمجة انظمة التشغيل عن طريق لغات البرمجة مثل لغة Linux Batch script		
Indicative Contents المحتويات الإرشادية			
Learning and Teaching Strategies			
استراتيجيات التعلم والتعليم			
Strategies	طرائق التعليم والتعلم 1. استخدام الشاشات الذكية بالإضافة 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		

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)

المناهج 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, tail 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 Bash 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:				



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	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	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	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 لتقييم 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.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-دراسة مستويات التوازي التي يمكن تطبيقها بالطرق المادية او البرمجية. 2-دراسة معمارية الأنظمة المتوازية ذات الذاكرة المشتركة وأنظمة الذاكرة الموزعة. 3-تعلم بعض المقاييس لتقييم تسارع البرامج المنفذة بالتوازي. 4-فهم أسلوب البرمجة المتوازية 5-فهم تنظيم طرق الاتصال بين عناصر الاحتساب المتوازي. 6-تعلم لغة واجهة تمرير الرسائل لبرمجة بعض المشاكل التي تحل بالتوازي.
Indicative Contents المحتويات الإرشادية	قراءات داخلية (المحاضرات) والحلقات النقاشية في المختبر. توجيه الطلاب الى قراءات خارجية لمواكبة عبر المكتبات الافتراضية والانترنت
Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	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 التأكيد على المنافسة بين الطالبات

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	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	64
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	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) المناهج 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
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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	

Relation With Other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
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	تهدف هذه المادة على تطوير الفهم الاساسي لتنظيم وتشغيل جهاز الحاسوب المكتبي بما في ذلك معمارية وحدة المعالجة المركزية , الذاكرة و اجهزة الادخال والايخراج . 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. 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.		
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 shop ورش 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	مقدمة عن تنظيم الحاسوب, اجيال الحاسوب , فئات الحاسوب. Introduction to Computer Organization, Computer Generations and Computer Categories.
Week 2	اجزاء الحاسوب الاساسية Main computer parts
Week 3	تمثيل البيانات Data Representation
Week 4	عمليات الحاسوب الحسابية Arithmetic Computer Operations
Week 5	تخزين البيانات Data Storage
Week 6	. ذاكرة الوصول العشوائي وانواعها RAM
Week 7	. ذاكرة القراءة فقط وانواعها ROM
Week 8	الأنظمة الرقمية
Week 9	التحويل بين الأنظمة الرقمية
Week 10	كيفية تعامل الحاسوب مع الأنظمة الرقمية
Week 11	التعرف نظام البايوز
Week 12	التعرف على كيفية إدارة العمليات في الحاسوب
Week 13	محاضرة على طريقة فرمتت الحاسوب الشخصي
Week 14	مراجعة عامة للمادة
Week 15	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	مقدمة عن نظام التشغيل
Week 2	التعرف على سطح المكتب واجزائه
Week 3	التعرف على أجزاء نظام التشغيل
Week 4	مقدمة عن برنامج مايكروسوفت اوفيس
Week 5	التعرف على الورد
Week 6	تطبيق عملي على نظام الورد
Week 7	عمل الجداول في نظام الورد
Week 8	التعرف على النصوص في الورد
Week 9	و تنسيق النص واطافة تنسيقات اضافية
Week 10	طباعة الملف وتنسيقات الطباعة
Week 11	اختبار تطبيق ادراج الصور والجداول
Week 12	تنسيق الترقيم في الورد
Week 13	تنسيق التصاميم الجاهزة في الورد
Week 14	اختبارات عمل وطباعة الكتب الرسمية وتنسيقها
Week 15	Mid Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text					Available in the Library?
Required Texts	ISBN الرقم المعياري	اسماء المؤلفين	سنة الاصدار	دار النشر	عنوان المؤلف	
	,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 Organization and Architecture	
	,9781284259445 ,2022062125 9781284259438	Linda Null	2023	Jones & Bartlett Learning	The Essentials of Computer Organization and Architecture , Sixth Edition	
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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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 والايخارج . 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 و اجهزة الادخال والايخارج.		
Indicative Contents المحتويات الإرشادية	1- قراءات، تعلم ذاتي، حلقات نقاش 2- التدريبات والانشطة في قاعة الدرس 3- ارشاد الطلاب الى بعض المصادر والموقع الالكتروني للاستفادة منها.		
Learning and Teaching Strategies			
استراتيجيات التعلم والتعليم			
Strategies	1- طريقة القاء المحاضرات. 2- Student Center. 3- (المجاميع الطلابية Team Project). 4- (Work shop ورش 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. Report	1	10% (10)	Continuous	
		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 تقديمي في البوربوينت
Week 14	اختبارات عن تطبيق البوربوينت
Week 15	Mid Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text					Available in the Library?
Required Texts	الرقم المعياري ISBN	اسماء المؤلفين	سنة الاصدار	دار النشر	عنوان المؤلف	
	,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:

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



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MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Language Translator 1		Module Delivery
Module Type	CORE		Theory Lecture Seminar
Module Code			
ECTS Credits	1		
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	

Relation With Other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	
Module Aims, Learning Outcomes and Indicative Contents			
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	1. To develop 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		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	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()		
Indicative Contents المحتويات الإرشادية			
Learning and Teaching Strategies			
استراتيجيات التعلم والتعليم			
Strategies			

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)	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	Introduction to Compiler, Cousins of Compiler (Translator, assembler, interpreter, loader, linker etc), Phases of Compilers.
Week 2	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.
Week 3	Role of the lexical analyzer, issues in lexical analysis, tokens, patterns, lexemes. Specification of tokens, Strings and languages, Finite automata, DFA, NFA
Week 4	Equivalence of NFA and DFA, Conversion of NFA to DFA.
Week 5	Minimizing states of DFA, C-NFA
Week 6	Regular Expression, regular grammar, Conversion of regular expression into NFA
Week 7	Midterm exam
Week 8	The role of Parser, Syntactic errors and recovery actions
Week 9	Context free Grammar, Parse Tree, Parse tree Derivation, Left most Derivation, Right most derivation, ambiguity.
Week 10	Eliminating ambiguity, predictive parsing, Recursive decent parsing, predictive parsing using tables
Week 11	Top-down parsing, bottom-up parsing, shift reduce parsing using the ACTION/GOTO Tables
Week 12	Top-Down Parsing: Recursive-Descent Parsing, FIRST and FOLLOW, LL (1) Grammars
Week 13	Bottom-Up Parsing: Handle Pruning, Shift-Reduce Parsing, Conflicts During Shift-Reduce Parsing
Week 14	LR Parsing: Simple LR, Items and the LR (0) Automaton, Constructing SLR-Parsing Tables, Viable Prefixes
Week 15	Canonical LR parser: Constructing LR(1) Sets of Items, Constructing LALR Parsing Tables
Week 16	Final Exam

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, Criel 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:				



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	Microprocessor and Assembly Language		Module Delivery	
Module Type	CORE		Theory Lecture Seminar	
Module Code				
ECTS Credits				
SWL (hr/sem)	ساعة 60			
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.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل		Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	
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	

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	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.		

Student Workload (SWL)

الحمل الدراسي للطالب

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

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	NUMBERS USED IN DIGITAL ELECTRONICS
Week 2	BASIC LOGIC GATES
Week 3	OTHER LOGIC GATES
Week 4	SIMPLIFYING LOGIC CIRCUITS: MAPPING
Week 5	Offset Address
Week 6	SIMPLIFYING LOGIC CIRCUITS: MAPPING
Week 7	Karnaugh Maps
Week 8	CODE CONVERSION
Week 9	BINARY ARITHMETIC AND ARITHMETIC CIRCUITS
Week 10	FLIP-FLOPS AND OTHER

	MULTIMBRATORS
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 REPRESENTATION
Week 6	CODE CONVERSION REPRESENTATION
Week 7	BINARY ARITHMETIC AND ARITHMETIC CIRCUITS REPRESENTATION
Week 8	SR FF REPRESENTATION
Week 9	COUNTERS (SERIAL COUNTER) REPRESENTATION
Week 10	Parallel Counters REPRESENTATION
Week 11	EXAMINATION
Week 12	SHIFT REGISTERS REPRESENTATION
Week 13	MICROCOMPUTER MEMORY REPRESENTATION
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
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	C –Good	جيد	70 – 79	Sound work with notable errors
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	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. Understanding 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
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	✓ 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: ✓ <i>Undirected Graph:</i> Explain undirected graphs. ✓ <i>Directed Graph:</i> 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: ✓ <i>Level by Level Traversing:</i> Describe level-order traversal. ✓ <i>Preorder Traversing:</i> Explain preorder traversal method. ✓ <i>In-order Traversing:</i> Discuss in-order traversal. ✓ <i>Post-order Traversing:</i> Outline post-order traversal technique. Tree Representation ▪ General Tree Representation: ✓ <i>Max Number of Branches:</i> Discuss constraints on branches in general trees. ✓ <i>Two Pointers (Sun, Brother):</i> Explain pointer representation for general trees. ✓ <i>Three-Pointers (Sun, Brother, Father):</i> Describe advanced pointer representation techniques. ▪ Binary Tree Representation: ✓ <i>One Dimension Array:</i> Illustrate binary tree representation using one-dimensional arrays. ✓ <i>Two Dimensions Array:</i> Discuss two-dimensional array representations. ✓ <i>Two Pointers (Left Child, Right Child):</i> Explain binary tree node representation using two pointers. ✓ <i>Three Pointers (Left Child, Right Child, Father):</i> 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 أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	65	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	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. Necaie, 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:				



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	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	
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

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	78	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	
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
	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 الأسبوعي 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.	

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GRADING SCHEME				
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	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	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	
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 représentations 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 أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	
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 الأسبوعي 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
	C –Good	جيد	70 – 79	Sound work with notable errors
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	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
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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	Computer Architecture			Module Delivery	
Module Type	CORE			Theory Lecture Seminar	
Module Code	COM2404				
ECTS Credits	6				
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		

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	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.
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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 الأسبوعي 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
	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
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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 Ghani	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	

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, the students will be able to understand and explain the principles of the computer programming.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	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.		
Indicative Contents المحتويات الإرشادية	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.		
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. 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 أسبوعياً	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	73		

Module Evaluation

تقييم المادة 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)

المناهج الأسبوعي 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
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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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 Ghani	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		

Module Evaluation

تقييم المادة الدراسية

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

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) المناهج 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:				



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MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Embedded Systems		Module Delivery
Module Type	SUPPLEMENT		Theory Lecture Seminar
Module Code	UOBAB0604065		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	
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 الأسبوعي 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). <i>Embedded Systems</i> (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				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 – 100	Outstanding Performance
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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:				



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MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Software Engineering		Module Delivery	
Module Type	SUPPLEMENT		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

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Quizzes, Practical test, Writing Reports, Assignment Implementation
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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 أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	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 الأسبوعي 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 be applied 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 and Date 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 Project-Part1
Week 15	Daily reminder Project-Part2

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Roger S. Pressman & Bruce R. Maxim, "Software Engineering: A Practitioner's Approach", 9 Edition, 2023.	No
Recommended Texts	Robert C. Martin (Uncle Bob)"Clean Code: A Handbook of Agile Software Craftsmanship", 2 Edition, 2022.	No
Websites	http://www.pearsonhighered.com/sommerville/	

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



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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	3	Semester of Delivery	
Administering Department	Computer	College	Computer Science for Women
Module Leader	Ghasaq Basim Abdulwahid	e-mail	ghasaq.kadhim.bscl@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	

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	• 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 الأنشطة • 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)		

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

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
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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.(2009).New Headway. 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/forms/d/e/1FAIpQLSdOjWPC_YBfvTKqUTOY0pU1

		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:				



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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.bscl@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		

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	● 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 اللقاء المحاضرات ● تعمّد الخطأ! ● Student center ● المجاميع الطلابية (team project)		

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

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	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/forms/d/e/1FAIpQLSdOjWPC_YBfvtKqUTOY0pU1AfGPBgm9

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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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MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Computation theory		Module Delivery
Module Type	Core		Theory Lecture Seminar
Module Code	COM24113		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	4
Administering Department	Computer science	College	SciW
Module Leader	Elaf Ali Abbood	e-mail	wsci.elaf.ali@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	01/06/2023	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	On completion of this course, students will be able to explain the basic methods and conclusions of the Theory of Computation. They will be able to apply these methods to problems from different fields and be guided by the results in searching for computational solutions to the problems. Also, this course is offered to undergraduates and introduces basic mathematical models of computation and the finite representation of infinite objects. Topics covered include: finite automata and regular languages, context-free languages, Grammar types, Ambiguous Grammar, Nondeterministic and Deterministic FSA, and Pushdown Automata.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• To understand the formal languages and grammars: regular grammar and regular languages, context-free languages and context-free grammar; and introduction to context-sensitive language and context-free grammar, and unrestricted grammar and languages. • To understand the relation between these formal languages, grammars, and machines. • To understand the complexity or difficulty level of problems when solved using these machines. • able to design Finite Automata machines for given problems; • able to analyze a given Finite Automata machine and find out its Language; • able to design Pushdown Automata machine for given CF language(s); • able to generate the strings/sentences of a given context-free languages using its grammar; • able to design Turing machines for given any computational problem.
Indicative Contents المحتويات الإرشادية	
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Questioning: searching for new information by forming and raising questions. Conclusion: Think beyond the available information to fill in the gaps. Comparison: Noting the similarities and differences between two or more things.

Classification: putting things into groups according to common characteristics

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	78	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
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. Report	1	10% (10)	Continuous	
		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 الأسبوعي النظري

	Material Covered
Week 1	Alphabet, String, Formal Language, and Basic Concepts
Week 2	The Grammars: Left Linear Grammar and right Linear Grammar
Week 3	Derivation and Parse Tree
Week 4	Grammar types: Unrestricted, context-sensitive, context-free, regular grammar
Week 5	Ambiguous Grammar
Week 6	Chomsky Normal Form and Greibach Normal Form
Week 7	Regular Expression and Properties of Regular Sets
Week 8	Finite State Automata
Week 9	Nondeterministic FSA and Deterministic FSA

Week 10	Convert NFA into DFA
Week 11	Pushdown Automata
Week 12	Language of Pushdown Automata and examples
Week 13	Turing machine
Week 14	Examples for transitions of Turing machine
Week 15	Mid Exam
Week 16	Final exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Daniel I. A. Cohen, , Introduction to Computer Theory, 2nd, Wiley, 1996, ISBN-10: 0471137723	
Recommended Texts	1. Sipser, Michael, Introduction to the Theory of Computation, 3rd ed. Cengage Learning,, 2013 2. Martin, John, Introduction to Languages and the Theory of Computation, New York, NY: McGraw Hill, 2002, ISBN: 0072322004. 3. Kozen, Dexter, Automata Theory , New York, NY: Springer-Verlag, 2016, ISBN: 0387949070.	
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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	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 Graphics		Module Delivery
Module Type	CORE		Theory Lecture Seminar
Module Code	COM35021		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	5
Administering Department	Computer science	College	wsci
Module Leader	Elaf Ali Abbood	e-mail	wsci.elaf.ali@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	01/05/2025	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 course introduce explanation and understood to the principles of computer graphics and how to creates 2D and 3D images using arithmetic relations that simulates the real world. Also, computer graphics depicts concepts of 3D graphics help the students to design system in this field.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Understanding how to create graphics in the calculator, starting from simple geometric shapes such as a point, a straight line, and a circle, all the way to complex shapes made up of geometric shapes. 2- Understanding the basics of drawing geometric shapes based on mathematical relationships and special algorithms. 3- Understand drawing different shapes such as the arc, ellipse, polygon, and star. 4- Knowing the different methods of transitions, how to enlarge and reduce shapes, reflection and rotation.
Indicative Contents المحتويات الإرشادية	
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Practical laboratories that develop students' thinking skills • Intellectual test questions • Overlapping with other disciplines (mathematics applications)

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	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
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	Introduction to Computer Graphics, Raster and Vector Representing Image file, Scan-Conversion
Week 2	Slop line equation Algorithm
Week 3	DDA straight line Algorithm
Week 4	Bresenham's line Algorithm
Week 5	Circles Algorithms
Week 6	Ellipses algorithm
Week 7	Arc algorithm
Week 8	Star Algorithm
Week 9	Draw complex figures using the primitives drawing
Week 10	2D Geometric transformation Translation in functions and matrices
Week 11	Scaling zoom in and zoom out
Week 12	Rotation types in functions and matrices
Week 13	Reflection, shrink, stretch, and shearing
Week 14	Introduction to 3D Computer graphics Three-dimensional Display Methods Parallel Projection Perspective Projection
Week 15	Rendering Techniques Rendering pipeline and methods
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to visual basic .Net programming language Apply build-in primitives figure drawing instructions
Week 2	Apply Slope line equation Algorithm
Week 3	Apply DDA algorithm
Week 4	Apply Bresenham's line algorithm
Week 5	Apply Circles Algorithms
Week 6	Apply ellipse drawing algorithm
Week 7	Apply arc drawing algorithm
Week 8	Apply Star Algorithm
Week 9	Apply examples to draw complex primitives
Week 10	Apply translation on drawings
Week 11	Apply the scaling
Week 12	Apply the rotation in types
Week 13	Apply the reflection, shrink, stretch, and shearing
Week 14	Introduction to animated figures Apply animated figures examples
Week 15	Discuss computer graphics projects
Week 16	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	"Computer Graphics " C Version, 2nd Edition, Donald Hearn and M. Pauline Baker, Prentice Hall, Inc, 1998.	
Recommended Texts	"The Computer Graphics Manual" , Volume 1, Salomon D. , Springer , 2011.	
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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MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Mobile's Applications		Module Delivery
Module Type	ELECTIVE		Theory Lecture Seminar
Module Code			
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	8	Semester of Delivery	
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.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	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.

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 أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	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 الأسبوعي 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

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		
Recommended Texts	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	
Websites	Website: https://developer.android.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:



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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	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. Research Design and Methodology: Types of research designs: Experimental, non-experimental, and exploratory. Sampling Techniques: Types of sampling methods: Probability and non-probability sampling. Data Collection Methods: Surveys, interviews, questionnaires, and observation. Data Analysis Techniques: - Statistical analysis for quantitative research. - Thematic and content analysis for qualitative research. Research Ethics and Integrity: Ethical issues in research: Informed consent, privacy, and confidentiality. Writing Research Proposals and Reports: Structure and components of research proposals and final reports. Presenting Research Findings: Writing and presenting research findings effectively. Review of Research Methodologies: Comparison and evaluation of different research methods and methodologies.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Interactive Lectures and Discussions - Lectures will be interactive, encouraging student participation through discussions, questions, and problem-solving activities. Case Studies and Real-Life Examples - Case studies from various fields will be used to demonstrate the application of research methodologies in real-world scenarios. Group Work and Collaborative Learning - Students will be divided into groups for collaborative learning, promoting teamwork and peer feedback during research proposal development and problem-solving activities. Self-Directed Learning - Students will be encouraged to explore additional resources beyond class materials, such as academic papers, research articles, and online databases, to foster independent learning. Hands-On Practical Sessions - 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 - 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 - 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 - 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 - 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 - Lecturers will provide one-on-one mentorship for students, guiding them through the process of designing and conducting their research projects.
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل		Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	
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	

	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:

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