Academic Program Description Form

University Name: Al- Nahrain University
Faculty/Institute: College of Science
Scientific Department: Computer Science
Academic or Professional Program Name: Bachelor in Computer Science
Final Certificate Name: Bachelor in Computer Science
Academic System: Semester System **-Bologna**
Description Preparation Date: 12/1/2025
File Completion Date: 12/1/2025

Signature: KH-A
Head of Department Name:
Assi. Prof. Dr. Khamael Al-Dulaimi
Date:

Signature:
Scientific Associate Name:
Manaf Adnan
Date:

The file is checked by:
Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department:
Date:
Signature:

Dean of Science College Approval

1. **Program Vision**
Our vision is that the department with the College will be world-class "educational" "research" and "international" in its programs, curricula, and scientific research and will seek to achieve a prominent place among the relevant departments of Iraqi and international universities by providing and updating modern, distinct programs focusing on labor market requirements and development and that research and scientific activities will be supportive of technological development.

2. Program Mission

The department's mission is to prepare, qualify, and upgrade the labor market with distinguished graduates with the necessary knowledge and practical skills to build computer systems software, possess functional intelligence skills, and equip them to meet the needs of the National Development Plan and support the public and private sectors, and to be able to conduct scientific and applied research, provide advisory services and training in the fields of specialization and keeping pace with today's demands.

3. Program Objectives

The program aims to prepare the students professionally and scientifically to apply what they have learned in the following areas
(Artificial intelligence, database management systems, website development, application development for smartphones, software engineering, computer security, and data mining) in practice through:

1. Acquiring knowledge and skills in the field of computer science along with relevant knowledge and skills in all fields.
2. Possessing communication and learning skills that prepare them to acquire knowledge in the field of the labor market and/or admission to graduate programs.
3. Acquiring good analysis, design and implementation skills required to formulate and address computing problems with an understanding of the processes that support the delivery and management of secure computing-based solutions within a specific application environment.

Integrating an understanding of the general human context with the solutions offered by side-by-side computing as well as strong analytical and critical thinking skills. It will develop graduates' awareness and enable the use of their contributions in a social, business, technical, ethical and humanitarian context.

4. Program Accreditation

Not yet

5. Other external influences

Deans of Sciences Colleges Committee

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	**2**	**2**		
College Requirements	**0**	**0**		
Department Requirements	**20**	**12**		
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
First Class	URCOM	Computer	2	2
	COMP1101	Programming Fundamentals	3	4
	COMP1102	Discrete Structure	2	2
	CRCAL1	Calculus I	2	2
	CRELE	Electronics	-	2
	URENG1	New Headway Plus	1	-
Second Class	COMP2105	Object Oriented Programming	2	2
	COMP2106	Structured Programming	3	2
	COMP2107	Computer Skills I	0	2
	COMP2108	Data Structure	2	2
	COMP2109	Computation Theory	3	0
	URARA	Arabic Language	2	0
	URENG2	New Headway Plus	2	0

8. Expected learning outcomes of the program

Knowledge	
1.Enabling students to obtain knowledge and understanding of computer basics 2. Enabling students to obtain knowledge and understanding of computer applications 3. Enabling students to obtain knowledge and understanding of computer programming 4. Enabling students to obtain knowledge and understanding of computer networks 5. Enabling students to obtain knowledge and understanding of multimedia 6. Enabling students to obtain knowledge and understanding of data science and mining	
Skills	
1-Scientific skills in writing project	

2. Logical thinking and analysis skills 3. Skills by using modern applications 4. Practical application skills	
Ethics	
1. Teaching students the moral goals of the educational process 2. Teaching students the importance of educational guidance in university studies 3. Teaching students how to interact positively with other colleagues in order to reach a state of academic excellence	

9. Teaching and Learning Strategies

1. Providing students with the basics and additional topics related to the outcomes of logical thinking and analysis.
2. Creating discussion groups during lectures to discuss specialized topics that require thinking and analysis.
3. Asking students a set of thinking questions during lectures, such as what, how, when, and why for specific topics.
4. Giving students homework that requires self-explanation
5. Scientific visiting to work sites, companies and departments and learning how to use computer systems in reality

10. Evaluation methods

1-Quality standardsing
2. Daily exams with self-solved home-based questions.
3. Participation marks for competitive questions related to the academic subject.
4. Specific grades with homework assignments.
5. Small project
6. Monthly exams and quarterly exams

11.Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Ban Nadeem Dhannoon Younis	computer	AI and image processing			staff	

Mohammed Sahib Mahdi	physics	Multimedia and Robotics			staff	
AbdulKareem Merhej Radh	physics	AI			staff	
Jamal Mohammed Kadhim Ali	computer	Computer security			staff	
Sawsan Kamal Thamer Mohammed al-ani	computer	AI			staff	
Suhad Abdul-Rahman Yousif	computer	AI			staff	
Safaa Hussain Shwail	computer	AI \ Robot Path Planning			staff	
Zainab Namh Abdula Sultani	computer	Multimedia			staff	
Khameal Abbas Khudhair	computer	AI			staff	
Abeer Khalid Ahmed	computer	AI			staff	
Dalal Naeem Hmood	computer	Computer network			staff	
Nadia Fadhil Ibrahim	computer	AI			staff	
Azhar Mawlod Khathum Meyessar	computer	AI			staff	
Ghassan Abdulhakeem Mohmood	computer	Multimedia			staff	
Haider Majeed Jaber	computer	Computer network and security			staff	
Tiba Zaki Abdulhameed	computer	AI			staff	
Nagwan Abed Hasan	computer	Data security			staff	
Rasool Hisham Abd Al-Rasool	computer	Computer network and security			staff	
Ruaa Abdullah Jaber	computer	Image processing			staff	
Azahar Flaih Hassan zaho	computer	AI			staff	
Hanaa mohammed mushjil zinad	computer	AI			staff	
Assel Basim Sabri Yakoob	computer	AI			staff	

Khairiyah Saied Abd-algabbar Jasim	computer	Digital Image Processing			staff	
Zahraa Abdul hussienjaaz abed	computer	Computer network			staff	
Hasnaa imad abdulsalam	computer	Bioinformatics			staff	
Zainab Haider Ameen	computer	Computer network			staff	
Ehsan Qahtan Ahmed	computer	Computer network			staff	
Israa Husain Ali	computer	Digital Image processing			staff	
Farah Saad Ezz Al-dean	computer	Image processing			staff	
Asad Hussain Thary	computer	AI and Image Processing			staff	
Humam Khalid Jameel	computer	Computer			staff	
Wisam Rafid Dawood	Math	Math			staff	
Zeyad Mohammed Abed	Math	Graph Theory			staff	
Bahera Hani Nayef	physics	Information technology			staff	

Professional Development

Mentoring new faculty members

1- The department head schedules meeting with new faculty members and the rest of the faculty members and gives them information, awareness, and general background about the department and the department's academic program.
2- Workshops have been scheduled for faculty members to support knowledge and skills in teaching, scientific research, and quality assurance.

Professional development of faculty members

- Workshops have been scheduled to clarify the roles of university faculty members
- workshops and training have been scheduled on effective learning
- panel discussion have been scheduled to discuss the role of the academic staff and educational guidance
- conferences and seminars have been scheduled about academic research and how to participate in the professional development of faculty members.

12. Acceptance Criterion

System has been established by the Ministry of Higher Education and Scientific Research as a central admission mechanism to be considered

13. **The most important sources of information about the program**

For key sources of information about the academic program, please visit the Department of Computer Science website https://sc.nahrainuniv.edu.iq/departments_ar.php?did=3

14. Program Development Plan

The program development plan is discussed annually with labour market employers and the department's scientific committee, and the syllabus is developed with updates based on the labour market's vision and the instructions of the Ministry of Higher Education and Scientific Research.

Program Skills Outline

Year/Level	Course Code	Course Name	Basic or optional	Required program Learning outcomes											
				Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
First	URCOM	Computer	B	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
	COMP1101	Programming Fundamentals	C	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
	COMP1102	Discrete Structure	C	✓	✓	✓		✓					✓		
	CRCAL1	Calculus I	S	✓	✓	✓		✓	✓				✓		
	CRELE	Electronics	S	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
	URENG1	New Headway Plus	B	✓	✓	✓	✓	✓	✓				✓	✓	✓
Second	COMP2105	Object Oriented Programming	C	✓	✓	✓	✓	✓	✓				✓	✓	✓
	COMP2106	Structured Programming	E	✓	✓	✓	✓	✓	✓	✓			✓	✓	
	COMP2107	Computer Skills I	C	✓	✓	✓		✓	✓				✓	✓	✓
	COMP2108	Data Structure	C	✓	✓	✓		✓	✓				✓	✓	
	COMP2109	Computation Theory	C	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
	URARA	Arabic Language	B	✓	✓	✓						✓	✓	✓	

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Ministry of Higher Education and Scientific Research - Iraq
Al-Nahrain University
College of Science
Computer Science Department

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Calculus (I)**			**Module Delivery**	
Module Type	**Support**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CREQ1201**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level		2	**Semester of Delivery**		1
Administering Department		Mathematics and computer Applications	**College**	Science	
Module Leader	Dunya mohee		**e-mail**	Dunya.mohee@nahrainunive.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Master degree
Module Tutor	م م زياد محمد عبد		**e-mail**		
Peer Reviewer Name		Dr Ommer Ismaal	E-mail	**omar.ismael@nahrainuniv.edu.iq**	
Scientific Committee Approval Date			**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	The aim of this course is to introduce the concept of limits and derivative, study various techniques of derivatives, then using these concepts in understanding mixed problems of derivatives applications
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	After completing the course, students have the ability 1. To determine some special functions. 2. To determine the limits of the function in general. 3. To determine the derivatives of functions in general 4. To compute derivatives involving transcendental functions. 5. To compute inverse trigonometric derivatives. 6. To demonstrate ability to think critically by recognizing the applications of derivativs 7. To demonstrate an intuitive and computational understanding for derivativel applications by solving a variety of problems from physics, engineering and mathematics.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The module will be presented to the students through a specified series of lectures, supported by problem solving practice carried out in interactive tutorials. These tutorials will be supported by practice and directed study outside the classroom. Formative assessment takes place throughout the

	module during tutorials and feedback is given during these tutorials.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	67	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.466
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**	1	10% (10)	6, 10	LO #1, 2, and 6
	Assignments	1	10% (10)	7, 12	LO # 3 and 7
	Projects / Lab.	1	10% (10)	continuous	
	Report	1	10% (10)	14	LO # 5, 7 and 8
Summative assessment	**Midterm Exam**	1	10% (10)	5,11	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	Limites(basic definition+some examples)
Week 2	Some special types of limite
Week 3	Limits of trigonometric limits
Week 4	Continuous functions and their limits
Week 5	Derivatives (basic theorems)
Week 6	General examples for derivatives
Week 7	Mid-term exam
Week 8	Trigonometric functions and their limits
Week 9	Some applications of derivatives
Week 10	Special functions and their derivatves
Week 11	Mixed problems of derivatives
Week 12	Inverse trigonometric functions
Week 13	Derivatives Inverse of trigonometric functions
Week 14	Mixed Examples
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		
Recommended Texts		
Websites		

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors

	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

	Ministry of Higher Education and Scientific Research - Iraq Al-Nahrain University College of Science Computer Science Department	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	Discrete Structure	**Module Delivery**	
Module Type	CORE		☒**Theory** ☐**Lecture** ☐**Lab** ☒**Tutorial** ☐**Practical** ☐**Seminar**
Module Code	COMP1102		
ECTS Credits	5		
SWL (hr/sem)	125		

Module Level	1	**Semester of Delivery**	1
Administering Department	Computer Science	**College**	Science
Module Leader	Lecturer Azhar M. Kadim	**e-mail**	azhar.mawlodkadim@nahrainuniv.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	Prof. Dr. Mohammed Sahib Mahdi	**e-mail**	Mohammed.sahibmahdi@nahrainuniv.edu.iq
Review Committee Approval	25/5/2023	**Version Number**	1.0

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Introduction to Discrete Mathematics: Introduce students to the basic concepts and techniques of discrete mathematics and their relevance to computer science. 2. To develop problem-solving skills. 3. To understand fundamental mathematical structures. 4. Logic and Proof Techniques: Develop students' understanding of propositional and predicate logic, including logical connectives and quantifiers. Teach proof techniques, such as direct proof and mathematical induction. 5. To apply concepts in computer science and information technology. 6. To enhance logical reasoning and critical thinking.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understanding fundamental concepts in discrete mathematics. 2. Applying mathematical reasoning to problem-solving. 3. Analyzing algorithms using mathematical techniques. 4. Solving combinatorial problems. 5. Developing formal proofs. 6. Applying discrete mathematics to computer science. 7. Enhancing problem-solving skills.
Indicative Contents المحتويات الإرشادية	Understanding what is discrete mathematics & Propositional logic. Learning what is Truth Tables of Compound Propositions [25 hrs] Applications of Propositional Logic: Logic Circuits [25 hrs] Understanding Predicates and Quantifiers [25 hrs] Explaining proof strategies and their methods (contrapositive , contradiction) [25 hrs]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Clear organization and structure of course material

	• Use of examples and illustrations to clarify concepts • Problem-solving approach with relevant exercises • Interactive learning activities and group work • Gradual increase in difficulty level of topics • Highlighting practical applications of discrete mathematics • Regular formative assessments and timely feedback • Providing additional resources and references for further study • Encouraging critical thinking and analysis • Creating a supportive learning environment

Student Workload (SWL)
الحمل الدراسي للطالب

SSWL (Structured SWL (h/sem)) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.13
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	15% (15)	5, 10	All
	Assignments	2	15% (15)	2, 12	All
	Projects / Lab.				All
	Report	1	10% (10)	13	All
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	All
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	What is discrete mathematics & Propositional logic

Week 2	Conditional statement
Week 3	Conditional statement (converse,contrapositive and inverse)
Week 4	Truth Tables of Compound Propositions
Week 5	Precedence of Logical Operators
Week 6	logic and bit operations
Week 7	Mid-term Exam I
Week 8	Applications of Propositional Logic: Logic Circuits
Week 9	Propositional Equivalences
Week 10	Predicates
Week 11	Quantifiers
Week 12	Proof strategies
Week 13	Proof Methods and Strategy: contrapositive , contradiction
Week 14	Mid-term Exam II
Week 15	**Preparatory Week**
Week 16	**Final Exam**

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		Yes

	"Discrete Mathematics Applications and Its Kenneth H. Rosen Eighth Edition", Kenneth H. Rosen, 2019.	
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:

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

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 Al-Nahrain University College of Science Computers Department	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	ELECTRONICS	**Module Delivery**	
Module Type	CORE		☒**Theory** ☒**Lecture** ☒**Lab** ☐**Tutorial** ☐**Practical** ☒**Seminar**
Module Code	COMP124		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	1	**Semester of Delivery**	2
Administering Department	Computer Science	**College**	Science
Module Leader	Mohammed Sahib Mahdi Zina Muafiq + Wasan Ali	**e-mail**	Mohammed.sahibmahdi@nahrainunive.edu.iq
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	AbdulKareem Merhij	**e-mail**	abdulkareemmerhij@nahrainunive.edu.iq
Review Committee Approval	15/5/2023	**Version Number**	1.0

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This module introduces the student to understand the difference between the analog and digital concepts, how analog to digital conversion process is performed and what specification is needed. Other topics include: general view on diode structure, biasing types, current and voltage characteristics of diodes. Then, some common application circuits of diodes such as regular, rectifier, and limiter are demonstrated. Later, bipolar transistor is given including; structure, common configuration, switch transistor and how its converted into logic gate.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Define the problem (input and output), and write its functions. 2. Estimate both the current and voltage of the diode contributed in electronic circuit. 3. Sketch the I-V characteristics curve of the diode and can determine the operation point of such diode. 4. Design simple circuit for given application. 5. Understand structure, operation, and functions of the transistor. 6. Understand how converts the transistor to be digital logic gate.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: This module introduces the student to understand the digital circuits. [25 hrs] Digital circuits design in computers. [25 hrs] Other topics include: logic circuits, flip flop, registers, RAM. [25 hrs] Some common application circuits of digital RAM types are demonstrated. [25 hrs]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The length of the semester is 16 weeks, including the exam, and there will be approximately 102 hours dedicated to teaching the student the theoretical and practical foundations of the subject of the course, including the theoretical subject, which will take a period of 45 lecture hours (three hours per week) and a practical subject of 30 hours during the course (two hours per week). Two hours are devoted to the mid-term exam, three hours for short exams that extend from the middle to the end of the course, then 20 hours for seminars, homework and the like.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem)	63	**Structured SWL (h/w)**	4.2

الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.5
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
	Assignments	2	10% (10)	2, 12	LO # 2, and 3
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 4, and 5
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Analog and Digital Concepts.
Week 2	Electronic Signal. Analog and Digital Signals.
Week 3	A\D Conversion. Sampling and quantization. PCM
Week 4	Conductors, Semiconductors, and Isolators. P-N Junction.
Week 5	Potential barrier of diode. Reverse biasing diode. Reverse Breakdown of a diode.
Week 6	Forward biasing diode. I-V characteristics of diode. Diode circuit analysis, load line method, approximation method. Zener diode.
Week 7	Zener diode specification and rates. Voltage regular. Positive/negative half wave rectifier.
Week 8	Full wave rectifier. Two sources circuits. Voltage limiter.
Week 9	Lights emitting diode (LEDs).
Week 10	Bipolar transistor structure. Bipolar transistor operation.
Week 11	Common-base configuration.
Week 12	Common-base characteristics.
Week 13	Common-collector configuration.

Week 14	Common-emitter configuration.
Week 15	Amplifier. Switch transistor (saturation and cutoff states). Switching circuit application.
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Analog and Digital Signals.
Week 2	Lab 2: Reverse biasing diode.
Week 3	Lab 3: Forward biasing diode.
Week 4	Lab 4: I-V characteristics of diode
Week 5	Lab 5: Diode circuit analysis
Week 6	Lab 6: load line method.
Week 7	Lab 7: approximation method.
Week 8	Lab 8: Zener diode.
Week 9	Lab 9: Voltage regular. Positive/negative half wave rectifier.
Week 10	Lab 10: Full wave rectifier. Voltage limiter.
Week 11	Lab 11: Lights emitting diode (LEDs).
Week 12	Lab 12: Bipolar transistor
Week 13	Lab 13: Common-base characteristics.
Week 14	Lab 14: Common-collector configuration.
Week 15	Lab 15: Common-emitter configuration.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Charles R. Kime, "Physical Electronic Principles", Pearson Prentice Hall,2012.	Yes
Recommended Texts	John F. Wakerly "Digital Design:Principles and Practices Package" 4th edition, Prentice-Hall, 2007.	Yes

Websites	https://sc.nahrainuniv.edu.iq/computers/comp_104.pdf

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:				

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

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 Al-Nahrain University College of Science Computer Science Department	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	English Language			**Module Delivery**	
Module Type	BASIC			☒**Theory** ☐**Lecture** ☐**Lab** ☐**Tutorial** ☐**Practical** ☒**Seminar**	
Module Code	URENG1				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Computer Science		**College**	Science	
Module Leader	Lecturer Israa Namh Abdula		**e-mail**	Israa.asultani@nahrainuniv.edu.iq	
Module Leader's Acad. Title	Assist. Lecturer		**Module Leader's Qualification**	M.A.	
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name	None		**e-mail**	None	
Review Committee Approval	25/5/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Developing Basic Communication Skills: - Enable students to express themselves effectively in everyday situations. - Focus on building a foundation in speaking and listening. 2. Enhancing Reading Comprehension: - Improve students' ability to understand and interpret written texts. - Introduce strategies for effective reading comprehension. 3. Strengthening Writing Proficiency: - Develop students' writing skills across different genres (e.g., essays, emails, reports). - Emphasize grammar, sentence structure, and vocabulary usage. 4. Expanding Vocabulary: - Introduce new words and phrases to broaden students' vocabulary. - Provide strategies for effective vocabulary acquisition and retention. 5. Grammar Mastery: - Ensure a solid grasp of essential grammar rules and structures. - Focus on practical application in spoken and written communication. 6. Listening Skills Development: - Improve students' ability to comprehend spoken English in various contexts. - Provide exposure to different accents and speaking speeds. 7. Critical Thinking through Discussions: - Encourage students to engage in discussions to develop critical thinking skills. - Promote the use of evidence and persuasive language in discussions. 8. Effective Presentation Skills: - Equip students with the skills to deliver clear and engaging presentations. - Focus on aspects such as organization, delivery, and visual aids.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Students will demonstrate the ability to initiate and sustain simple conversations in English. 2. Students will be able to ask and respond to basic questions related to personal information, daily activities, and immediate surroundings. 3. Students will exhibit improved reading comprehension by accurately summarizing and analyzing information from a variety of texts. 4. Students will produce well-organized written compositions with a clear introduction, body, and conclusion. 5. Students will apply correct grammar and sentence structures in spoken and written communication. 6. Students will demonstrate improved listening comprehension across a range of accents and contexts

	7. Students will actively participate in discussions, expressing and defending their opinions. 8. Students will deliver clear and organized presentations using appropriate language and visuals.
Indicative Contents المحتويات الإرشادية	Basic Communication Skills: [7 hrs] • Greetings and introductions • Describing daily routines • Asking and answering simple questions Reading Comprehension: [6 hrs] • Short stories and simple narratives • Comprehension exercises with questions Writing Proficiency: [6 hrs] • Sentence structure and formation • Paragraph writing Vocabulary Expansion: [6hrs] • Everyday vocabulary • Academic vocabulary Listening Skills Development: [7 hrs] • Listening to dialogues and conversations • Podcasts and audio materials
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Emphasize interactive and communicative activities to engage students actively in the learning process • Design tasks that require students to use English to accomplish specific goals, fostering language use in context. • Recognize and accommodate diverse learning styles and paces within the classroom. • Incorporate authentic materials like newspaper articles, blogs, or videos to expose students to real-life language use. • Implement ongoing formative assessments, such as quizzes, peer evaluations, and class discussions, to gauge student progress. • Provide constructive feedback on both spoken and written language, and encourage students to reflect on their learning experiences • Adapt lesson plans based on the evolving needs and interests of the students, allowing for flexibility in the teaching approach.

Student Workload (SWL) الحمل الدراسي للطالب			
SSWL (Structured SWL (h/sem)) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	18	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	15% (15)	5, 10	LO #1, 3, 5 and 8
	Assignments	2	10% (10)	4, 12	LO # 2, 4, 5 and 6
	Projects / Lab.				
	Report	1	15% (15)	11	LO #4
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1, 3, 7, and 8
	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 the course, syllabus, and expectations.
Week 2	Unit One of the textbook “Hello”: Basic greetings and practice activities: counting, and identifying objects in the classroom.
Week 3	Unit One of the textbook “Hello”: Icebreaker activities for student interaction, Simple role-playing for greetings and numbers.
Week 4	Unit Two of the textbook “Your World”: Vocabulary related to daily routines and countries’ names. Present simple tense for daily activities. Describing things using adjectives.
Week 5	Unit Three of the textbook “All About You”: Vocabulary related to professions, questions and negatives, and Social expressions.
Week 6	Unit Four of the textbook “Family and Friends”: Possessive Adjectives, Possessive (‘s), and (Adjective+noun) • Reading and Speaking: Vocabulary related to food and meals, Reading and understanding a simple restaurant menu. • Role-playing restaurant scenarios.

Week 7	Mid-term Exam I
Week 8	Unit Five of the textbook “The Way I Live”: Uses of definite and indefinite articles, Adjectives + nouns. - Vocabulary related to food and meals. - Languages and Nationalities
Week 9	Unit Six of the textbook “Every day”: Adverbs of frequency used with present simple tense. - Vocabulary related to travel and transportation. - Asking for and giving directions. - Role-playing travel scenarios.
Week 10	Unit Seven of the textbook “My favourites”: Reading and writing a postcard and an e-mail to a friend. Adjectives and their opposites.
Week 11	Unit Eight of the textbook “Where I live”: Vocabulary related to travel and transportation and asking for and giving directions. Introduction to prepositions (prepositions of place)
Week 12	-Writing and talking about personal interests. -Group activity: planning a class event based on shared interests.
Week 13	Vocabulary related to health and daily activities. Expressions for discussing health. Role-playing doctor-patient scenarios.
Week 14	Mid-term Exam II
Week 15	**Preparatory Week**
Week 16	**Final Exam**

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	"New Headway Plus - Beginner", John and Liz Soars, 2014.	Yes
Recommended Texts	Short story "The Sound of Thunder" by Ray Bradbury	
Websites	www.youtube.com (short videos+ chosen movies)	

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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Introduction to Computer Science**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**URCOM**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	CS		**College**	College of Sciences	
Module Leader	Dr. Safaa H. Shwail		**e-mail**	safaa.husseinshwail@nahrainunive.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. The History of the Personal Computer 2. Understanding Digital Components 3. Processing, Storage, and Connectivity 4. Accessing, Using, and Managing Software 5. Application Software 6. Understanding System Software 7. Understanding Programming 8. How Networks Function 9. Threats to Your Digital Assets
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. You will be able to describe the history of personal computer hardware and software development. 2. You will be able to describe the devices that make up a computer system. 3. You will be able to describe how computers process and store data and how devices connect to a computer system 4. You will be able to explain the ways to access and use software and describe how to best manage your software. 5. Describe the different types of application software used for productivity and multimedia. 6. You will be able to explain the types and functions of operating systems and explain the steps in the boot process 7. You will be able to describe the life cycle of a software project and identify the stages in the program development life cycle 8. You will be able to explain the basics of networking, including the components needed to create a network, and describe the different ways a network can connect to the Internet. 9. You will be able to describe hackers, viruses, and other online annoyances and the threats they pose to your digital security
Indicative Contents المحتويات الإرشادية	Understanding Digital Components, Understanding Your Computer, Input Devices, Output Devices. Processing, Storage, and Connectivity, Processing and Memory on the Motherboard, Storing Data and Information, Connecting Peripherals to the Computer, Power Management and Ergonomics. Accessing, Using, and Managing Software, Software Basics, Managing Your Software, Application Software, Productivity and Business Software, Multimedia and Educational Software.

	Understanding System Software, Operating System Fundamentals, What the Operating System Does, Starting Your Computer. Understanding Programming, Life Cycle of an Information System, Life Cycle of a Program. How Networks Function, Networking Fundamentals, Network Architectures, Network Components, Connecting to the Internet. Threats to Your Digital Assets, Identity Theft and Hackers, Computer Viruses, Online Annoyances and Social Engineering.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is by explaining lectures in an interactive way by letting the students to participate in the presenting through questions and answers while at the same time refining and expanding their critical thinking skills. This will be achieved through classes and labs.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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**
	Quizzes	4	10% (10)	2,5,8,12	All

Formative assessment	**Assignments**	2	5% (5)	5,10	All
	Projects / Lab.	1	15% (15)	Continuous	All
	Report	1	10% (10)	10	All
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7,14	All
	Final Exam	3hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	The History of the Personal Computer
Week 2	Understanding Digital Components
Week 3	Understanding Digital Components (cont.)
Week 4	Processing, Storage, and Connectivity
Week 5	Accessing, Using, and Managing Software
Week 6	Application Software
Week 7	Application Software (cont.)
Week 8	Mid-term Exam 1
Week 9	Understanding System Software
Week 10	Understanding System Software (cont.)
Week 11	Understanding Programming
Week 12	Understanding Programming (cont.)
Week 13	How Networks Function
Week 14	Threats to Your Digital Assets
Week 15	Mid-term Exam 2
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Computer Hardware 1

Week 2	Lab 2: Computer Hardware 2
Week 3	Lab 3: Computer Assembly 1
Week 4	Lab 4: Computer Assembly 2
Week 5	Lab 5: Disk Operating System
Week 6	Lab 6: Dos Commands: Internal Commands
Week 7	Lab 7: Dos Commands: Internal Commands 2
Week 8	Mid-Term Exam 1
Week 9	Lab 8: Dos Commands: Internal Commands 3
Week 10	Lab 9: Dos Commands: Internal Commands 4
Week 11	Lab 10: Dos Commands: External Commands 1
Week 12	Lab 11: Dos Commands: External Commands 2
Week 13	Lab 12: Dos Commands: External Commands 3
Week 14	Lab 13: Dos Commands: External Commands 4
Week 15	Mid-Term Exam 2

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Technology in action complete, 16th edition, 2020.	No
Recommended Texts	Computer System Architecture 3rd edition by M.Morris Mano 1992	No
Recommended Texts	Fundamentals of Logic Design, 6th edition 2010	No

Grading Scheme
مخطط الدرجات

Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings

	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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	Ministry of Higher Education and Scientific Research - Iraq Al-Nahrain University College of Science Computer Science Department	

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Programming Fundamentals I			**Module Delivery**	
Module Type	Core			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	COMP1101				
ECTS Credits	11				
SWL (hr/sem)	275				
Module Level		1	**Semester of Delivery**		1
Administering Department		Computer Science	**College**	Science	
Module Leader	Dr. Hasnaa Imad Abdulsalam		**e-mail**	hasnaimad@nahrainuniv.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	Haider Majeed Jaber		**e-mail**	haidermjaber@gmail.com	
Peer Reviewer Name		Dr. Tiba Zaki Abdulhameed	**e-mail**	tiba.zaki@nahrainuniv.edu.iq	
Scientific Committee Approval Date		01/06/2023	**Version Number**		1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Think like a programmer. 2. Algorithmic thinking: being able to formulate the problem into steps using specific instruction. 3. Learn Java syntax to translate the algorithm steps to java program. 4. learn how to write, compile, test, fix errors, and run programs in java 5. Seeking new information.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	● **Identify the main structure of java programs** ● **Write simple programs:**This includes being able to write programs that solve specific problems. ● **Debug programs:**This includes being able to find and fix errors in programs. ● **Test programs:**This includes being able to write tests to ensure that programs work correctly. ● **Document programs:**This includes being able to write clear and concise documentation for programs. ● state the steps needed to solve a simple ● **Translate the algorithm steps to a java code.Problem-solving skills** Programming requires students to be able to break down complex problems into smaller, more manageable steps. ● **Critical thinking skills** Programming requires students to be able to think logically and to come up with creative solutions to problems. ● **Creativity** Programming can be a creative outlet for students to express themselves and to solve problems in new and innovative ways. ● **Communication skills** Programmers need to be able to communicate their ideas clearly and concisely to both technical and non-technical audiences. ● **Teamwork skills** Programming is often a team sport, and students need to be able to work effectively with others to achieve common goals.

Indicative Contents المحتويات الإرشادية	Indicative content includes the following. ● Introduction to programming languages ● Data types and variables ● Operators and expressions ● Control flow statement ● Methods (Functions)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main way this module will be taught is by encouraging students to participate in exercises, while also improving and expanding their critical thinking skills. This will be accomplished through lectures, interactive tutorials, and simple experiments that are interesting to the students. Here is a more detailed explanation of each point: ● **Encouraging student participation in exercises:** This will help students learn by doing and apply the concepts they are learning in a practical setting. ● **Improving and expanding critical thinking skills:** This will help students learn to think more deeply about the material and to come up with their own solutions to problems. ● **Lectures:** Lectures will provide students with the foundation they need to understand the material. ● **Interactive tutorials:** Interactive tutorials and discussions will allow students to practice the concepts they are learning in a safe environment. ● **Simple experiments:** Simple experiments will allow students to see the concepts they are learning in action.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) خلال الفصل للطالب الحمل الدراسي المنتظم	153	**Structured SWL (h/w)** للطالب أسبوعيا الحمل الدراسي المنتظم	10.2
Unstructured SWL (h/sem) خلال الفصل الحمل الدراسي غير المنتظم للطالب	122	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	8.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	275		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)		All
	Assignments	2	10% (10)		All
	Projects / Lab.	1	20% (20)	Continuous	All
	Report	0			
Summative assessment	**Midterm Exam**	2 hr	10% (10)		All
	Final Exam	3hr	50% (50)		All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Ch1: What is a computer, what is Programming, the hello world program, compiling java program. Displaying two messages
Week 2	Ch1:Formatting source code, using escape sequence, what is computer science?, Debugging programs,
Week 3	Ch2: Declaring Variables, Assigning Variables, Memory Diagrams, Printing Variables, and Arithmetic Operators

Week 4	Ch2: Floating-Point Numbers , Rounding Errors , Operators for Strings , Compiler Error Messages , and Other Types of Errors HW 2.12 Exercises .
Week 5	Ch3:The System Class, The Scanner Class , Language Elements, Literals and Constants, Formatting Output, Reading Error Messages
Week 6	Ch3:Type Cast Operators, Remainder Operator, Putting It All Together, The Scanner Bug HW 3.12 Exercises
Week 7	Mid Term Exam #1
Week 8	Defining New Methods, Flow of Execution, Parameters and Arguments, Multiple Parameters , Stack Diagrams, Math Methods, and Composition
Week 9	Ch4: Return Values , Incremental Development HW 4.11 Exercises
Week 10	Ch5: Conditionals and Logic Relational Operators , The if-else Statement , Chaining and Nesting , The switch Statement , Logical Operators , and De Morgan's Laws
Week 11	Ch5:Boolean Variables, Boolean Methods , Validating Input, Example Program HW 5.12 Exercises
Week 12	Mid Exam #2
Week 13	Ch6 Loops and Strings The while Statement, Increment and Decrement , and The for Statement .
Week 14	Ch6: Nested Loops
Week 15	**review**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introducing IDE Netbeans through "Hello world program like" Drow christmas tree using stars (print and println) https://www.edureka.co/blog/netbeans-tutorial/amp/
Week 2	Lab 2: compute simple calculations using constants (define length and width and calculate area)

Week 3	Lab 3: (Learning Reinforcement). compute simple calculations using constants (convert temperature from celsius to fahrenheit)
Week 4	Lab 4: Write Java code that computes the total cost and the number of tiles needed for a room of size 4.5x5 m, knowing that each tile is 60 x 60 cm, and the price of a meter square is 12$.
Week 5	Lab 5: try codes with errors. Read, understand, and fix the errors. print numbers in a formatted style (Write an application Powers.java that prints, in a table like style, the square root, square and cube of the numbers between 2 and 9)
Week 6	Lab 6: practice div , mod (convert 24 hour system to 12 (am,pm) system)
Week 7	Lab 7: Mid-term Exam
Week 8	Lab 8: method practice (void methods)Flow of Execution, Parameters and Arguments, Multiple Parameters .Method that calls another method.
Week 9	Lab 9: methods (calculator) Write a program to calculate the area and perimeter of a triangle. Your program should include areaCalculation and perimeterCalculation methods. The areaCalculation method has 2 parameters, which are the height and the base of the triangle and must return the area of a triangle. The perimeterCalculation method has 3 parameters
Week 10	Lab 10: The if-else Statement , Chaining and Nesting , The switch Statement.(salesman commission assignment)
Week 11	Lab 11: using boolean flag. validating input.
Week 12	Lab 12: Mid-term Exam
Week 13	Lab 13: while loop, for, (printing multiplication table of n)(validating input with loop)
Week 14	Lab 14: nested loop (math series)
Week 15	Lab 15: review

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Think Java: How to Think Like a Computer Scientist, 2 nd Edition, Version 7.1.0	free online

	Allen B. Downey and Chris Mayfield	
Recommended Texts	Introduction to Java Programming, Comprehensive Version, 10th Edition, by Y. Daniel Liang Head First Programming Head First Java	free online
Websites	Book's Website: https://books.trinket.io/thinkjava2/index.html https://codingbat.com/java https://www.codejava.net/java-se/file-io/how-to-read-and-write-text-file-in-java	

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

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

	Ministry of Higher Education and Scientific Research - Iraq Al-Nahrain University College of Science Computer Science Department	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Calculus (II)**			**Module Delivery**	
Module Type	**Support**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CREQ1201**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	2		**Semester of Delivery**	1	
Administering Department	Mathematics and computer Applications		**College**	Science	
Module Leader	Dunya mohee		**e-mail**	Dunya.mohee@nahrainunive.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Master degree	
Module Tutor			**e-mail**		
Peer Reviewer Name	Dr Ommer Ismaal		E-mail	**omar.ismael@nahrainuniv.edu.iq**	
Scientific Committee Approval Date			**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	The aim of this course is to introduce the concept of integration, study various techniques of integration, test improper integrals for convergence and illustrate some applications of integration. Student will gain proficiency to use integration to solve real world problems such as area and volumes problems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	After completing the course, students have the ability 1. To determine proper integral of one variable functions. 2. To determine integral involving the fundamental theorem of Calculus and method of substitution. 3. To determine the solution of problems involving the integral of one variable function. 4. To compute integral involving transcendental functions. 5. To compute integral with advanced integration techniques. 6. To demonstrate ability to think critically by recognizing patterns and determining and using appropriate techniques for solving a variety of integration problems. 7. To solve indeterminate forms and improper integral problems. 8. To solve the parametric representation of curves in the plane, calculate the length of a plane curve and solving area and volume application problems. 9. To sketch the graph of a polar equation and the area problems in the polar coordinate system. 10. To demonstrate an intuitive and computational understanding for integral applications by solving a variety of problems from physics, engineering and mathematics.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The module will be presented to the students through a specified series of lectures, supported by problem solving practice carried out in interactive tutorials. These tutorials will be supported by practice and directed study outside the classroom. Formative assessment takes place throughout the module during tutorials and feedback is given during these tutorials.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	67	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.466
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**	1	10% (10)	6, 10	LO #1, 2, and 6
	Assignments	1	10% (10)	7, 12	LO # 3 and 7
	Projects / Lab.	1	10% (10)	continuous	
	Report	1	10% (10)	14	LO # 5, 7 and 8
Summative assessment	**Midterm Exam**	1	10% (10)	5,11	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	Indefinite integrals, Definite integrals, The fundamental theorems of integrals, Basic Integration Formulas.
Week 2	Integration by substitution
Week 3	Integration of certain powers of trigonometric and hyperbolic functions
Week 4	Integrals involving trigonometric substitutions, Integrals involving hyperbolic substation .
Week 5	Mid-Term Exam + Integrals involving quadratic Function
Week 6	Integration by parts
Week 7	Integration of Rational Functions
Week 8	Integration of Irrational Functions, Integration of Rational Functions of Trigonometric
Week 9	Improper integrals: Definition of improper integral and examples
Week 10	Application of Definite Integrals: Area under the curve
Week 11	Mid-Term Exam + Area between two curves
Week 12	Volume of solid of revolution
Week 13	Arc length, Area of surface of revolution
Week 14	Area in polar coordinates
Week 15	Average value of functions, Moments and center of mass
	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	

Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		
Recommended Texts		
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Computer Organization**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**COMP1203**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level		1	**Semester of Delivery**		2
Administering Department		CS	**College**	College of Sciences	
Module Leader	Dr. Safaa H. Shwail		**e-mail**	safaa.husseinshwail@nahrainunive.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Introduction to Computer Science	**Semester**	1
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. Learning the Processor and its architecture 2. Exploring the Intel 80x86 Base Architecture I 3. Knowing the Instruction Set Architecture 4. Learning the Addressing Modes and the number of addresses 5. Recognizing the Characteristics of Memory Systems 6. Exploring the Memory Hierarchy and the difference between memory types.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. The main components of the Processor and its architecture 2. Processor level architecture 3. CPU level architecture 4. Intel 80x86 Base Architecture: Execution Unit 5. Intel 80x86 Base Architecture: Bus Interface Unit 6. Memory versus I/O Ports 7. Instruction Set Architecture 8. Addressing Modes and number of addresses 9. Memory Locations and Operations 10. Memory Hierarchy 11. Characteristics of Memory Systems 12. CACHE MEMORY PRINCIPLES 13. SEMICONDUCTOR MAIN MEMORY 14. Types of RAM 15. Types of ROM
Indicative Contents المحتويات الإرشادية	Learning the Processor and its architecture: Bus, Registers, Flags, Buffers, Stack, and I/O ports. Exploring processor and CPU level architecture. Exploring Execution unit of the Intel 80x86 Base Architecture: the general-purpose registers, address registers, flags, and Internal buses. Exploring Bus Interface Unit of the Intel 80x86 Base Architecture: Segment Addressing, Instruction Queue, and Memory versus I/O Ports. Knowing the Instruction Set Architecture: Data Movement Instructions, Arithmetic and Logical Instructions, Sequencing Instructions, and Input/Output Instructions. Learning the Addressing Modes and the number of addresses: Immediate Mode, Direct (Absolute) Mode, Indirect Mode, Indexed Mode, Relative Mode, Autoincrement Mode, and Autodecrement Mode. Recognizing the Characteristics of Memory Systems and Exploring the Memory Hierarchy and the difference between memory types: method of accessing units of

	data, CACHE MEMORY PRINCIPLES, SEMICONDUCTOR MAIN MEMORY, types of RAM, and types of ROMs.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is by explaining lectures in an interactive way by letting the students to participate in the presenting through questions and answers while at the same time refining and expanding their critical thinking skills. This will be achieved through classes and labs.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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**	4	10% (10)	2,5,8,12	All
	Assignments	2	5% (5)	5,10	All
	Projects / Lab.	1	15% (15)	Continuous	All
	Report	1	10% (10)	10	All
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7,14	All
	Final Exam	3hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Processor and its architecture
Week 2	Processor and its architecture (cont.)
Week 3	Intel 80x86 Base Architecture I
Week 4	Intel 80x86 Base Architecture I (cont.)
Week 5	Intel 80x86 Base Architecture II
Week 6	Intel 80x86 Base Architecture II (cont.)
Week 7	Intel 80x86 Base Architecture II (cont.)
Week 8	Mid-term Exam 1
Week 9	Instruction Set Architecture
Week 10	Instruction Set Architecture (cont.)
Week 11	Addressing Modes
Week 12	Addressing Modes (cont.)
Week 13	Memory Hierarchy
Week 14	Memory Hierarchy (cont.)
Week 15	Mid-term Exam 2
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction
Week 2	Lab 2: Movement Instructions
Week 3	Lab 3: Movement Instructions
Week 4	Lab 4: Movement Instructions
Week 5	Lab 5: Arithmetic Instructions
Week 6	Lab 6: Arithmetic Instructions
Week 7	Lab 7: Arithmetic Instructions
Week 8	Mid-Term Exam 1

Week 9	Lab 8: Logic Instructions
Week 10	Lab 9: Logic Instructions
Week 11	Lab 10: Logic Instructions
Week 12	Lab 11: Sequencing and Jump Instructions
Week 13	Lab 12: Sequencing and Jump Instructions
Week 14	Lab 13: Sequencing and Jump Instructions
Week 15	Mid-Term Exam 2

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Computer Organization and Architecture Designing for Performance, 8th Edition, by William Stallings, 2010	No
Recommended Texts	Computer Systems; A Programmer's Perspective - 2nd Edition, 2011	No
Recommended Texts	Fundamentals of Logic Design, 6th edition 2010	No

Grading Scheme
مخطط الدرجات

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

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

	Ministry of Higher Education and Scientific Research - Iraq Al-Nahrain University College of Science Computers Department	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	DIGITAL LOGIC	**Module Delivery**	
Module Type	CORE	☒**Theory** ☒**Lecture** ☒**Lab** ☐**Tutorial** ☐**Practical** ☒**Seminar**	
Module Code	COMP120		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	1	**Semester of Delivery**	2
Administering Department	Computer Science	**College**	Science
Module Leader	Mohammed Sahib Mahdi Ahmed Kadhum + Zainab Khalid	**e-mail**	Mohammed.sahibmahdi@nahrainunive.edu.iq
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	AbdulKareem Merhij	**e-mail**	abdulkareemmerhij@nahrainunive.edu.iq
Review Committee Approval	15/5/2023	**Version Number**	1.0

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. The student learns to build logical circuits. 2. The student learns to deal with current, voltage and digital signals 3. The student learns the components and functioning of digital storage units 4. The student learns the work of registration in computers 5. The student learns how to transmit a digital signal between computer components 6. The student learns the components of digital memory and data preservation
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Define the problem (input and output), write its functions. 2. Minimize function using any type of minimizing methods (Boolean algebra, Karnaugh map or Tabulation method). 3. Implement functions using digital circuit (combination or sequential). 4. Have knowledge in analyzing and designing procedures of combinational and sequential circuits. 5. Have knowledge in analyzing and designing circuits with flip-flops, counters and registers. 6. Work effectively with groups.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: This module introduces the student to understand the digital circuits. [25 hrs] Digital circuits design in computers. [25 hrs] Other topics include: logic circuits, flip flop, registers, RAM. [25 hrs] Some common application circuits of digital RAM types are demonstrated. [25 hrs]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The length of the semester is 16 weeks, including the exam, and there will be

	approximately 102 hours dedicated to teaching the student the theoretical and practical foundations of the subject of the course, including the theoretical subject, which will take a period of 45 lecture hours (three hours per week) and a practical subject of 30 hours during the course (two hours per week). Two hours are devoted to the mid-term exam, three hours for short exams that extend from the middle to the end of the course, then 20 hours for seminars, homework and the like.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.5
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
	Assignments	2	10% (10)	2, 12	LO # 2, and 3
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 4, and 5
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Digital Logic Design.
Week 2	Logic Gates and Boolean Algebra: Basic Definition, Boolean Functions.
Week 3	Standard Forms: Minterm and Maxterm, Simplification and Boolean Functions.
Week 4	Logic Operations: NAND,NOR, and Exclusive OR, Integrated Circuits.

Week 5	Gate Level Minimization: The Map Method, Two, Three, and Four variable Map.
Week 6	Product of Sums Simplification, Don't Care Conditions, NAND and NOR Implementation.
Week 7	The Tabulation Method, Simplification of Boolean Functions Using Tabulation Method.
Week 8	Analysis and Synthesis of Combinational Circuits: Combinational Circuits, Analysis and Design Procedure.
Week 9	Binary Adders and Subtractor, Decoders and Multiplexers.
Week 10	Analysis and Synthesis of Sequential Circuits: Sequential Circuits, Latches, Flip-Flops: RS, JK, and D.
Week 11	Analysis of Clocked Sequential Circuits, Design Procedure.
Week 12	Registers and Counters: Registers, Shift Registers, Synchronous Counters, Ripple Counters.
Week 13	Sequential Circuits with programmable Logic Devices: Random Access Memory, Memory Decoding.
Week 14	Read Only Memory, Programmable Logic Array.
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Digital Logic Signals.
Week 2	Lab 2: Logic Gates.
Week 3	Lab 3: Logic Operations.
Week 4	Lab 4: Binary Adders and Subtractor.
Week 5	Lab 5: Binary Decoders and Multiplexers.
Week 6	Lab 6: Flip Flop and RS Circuits.
Week 7	Lab 7: Clocked Sequential Circuits.
Week 8	Lab 8: Registers and Counters: Registers.
Week 9	Lab 9: Registers and Counters: Shift Registers, Synchronous Counters.
Week 10	Lab 10: Registers and Counters: Ripple Counters.
Week 11	Lab 11: Random Access Memory,
Week 12	Lab 12: Memory Decoding.
Week 13	Lab 13: Sequential Circuits with programmable Logic Devices
Week 14	Lab 14: Read Only Memory

Week 15	Lab 15: Programmable Logic Array.

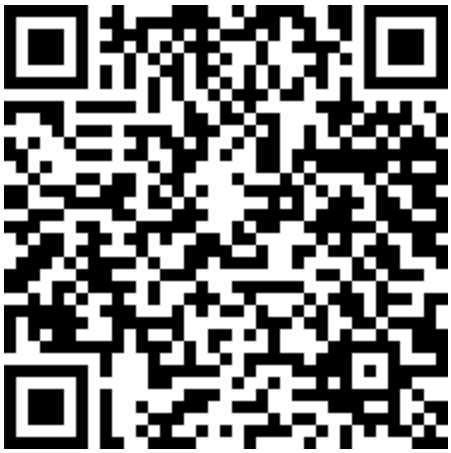
Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Morris Mano, Charles R. Kime, "Logic and Computer Design Fundamentals", Pearson Prentice Hall,2004.	Yes
Recommended Texts	John F. Wakerly "Digital Design:Principles and Practices Package" 4th edition, Prentice-Hall, 2007.	Yes
Websites	https://sc.nahrainuniv.edu.iq/computers/comp_102.pdf	

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:

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



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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	**Probability and Statistics**		**Module Delivery**
Module Type	**CR**		• ☒ **Theory** • ☒ **Lecture** • ☒ **Lab** • ☒ **Tutorial** • ☐ **Practical** • ☐ **Seminar**
Module Code			
ECTS Credits	**4**		
SWL (hr/sem)	**60**		
Module Level		**Semester of Delivery**	1
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	Name	**e-mail**	E-mail
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	me	**e-mail**	E-mail
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims **أهداف المادة الدراسية**	This course is designed to provide an introduction to a range of statistical tools of relevance to scientists. Specific topics include an overview of statistical distributions, significance testing, uncertainty determination, linear regression and experimental design. The application of statistics for quality control and practical experience in the application of statistical features in the widely used Minitab and Microsoft Excel is particularly emphasized. The teaching methods used will be a combination of lectures, self-study, labs, tutorials, and any combination of discussion, case study, problem-solving exercises and computer-based learning.
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	1. Describe basic statistical terms which are of relevance to the area of analytical science. 2. Graphically display and numerically summarise data using appropriate tables, graphs and measures of centre, spread and position. 3. Explain and apply concepts of basic probability including, conditional probability, Bayes' theorem, independent events and counting formulae. 4. Make interferences about population parameters using sample statistics using confidence interval estimates and tests of statistical hypotheses. 5. Describe the application of statistics to sampling, quality control, analytical method validation and experimental design. 6. Use an appropriate method for analysing relationships between variables in a dataset
Indicative Contents **المحتويات الإرشادية**	1. Describe basic statistical terms which are of relevance to the area of analytical science • Introduction to Statistical Terms • Populations and Samples • Data Types • Introduction to Sampling Methods 2. Graphically display and numerically summarise data using appropriate tables, graphs and measures of centre, spread and position. • Graphical Representation of data including frequency tables and charts • Measures of Central Tendency, Position and Dispersion. 3. Explain and apply concepts of basic probability including, conditional probability, Bayes' theorem, independent events and counting formulae; • Probability Experiments • Probability Trees • Classical Probability • Experimental Probability • Addition and Multiplication Rules of Probability • Counting Rules • Bayes Theorem

	• Discrete Probability Distributions • Binomial Distribution • Poisson Distribution • The Normal Distribution • Applications of the standard Normal Distribution • Assessing Normality • The Central Limit Theorem 4. Make interferences about population parameters using sample statistics using confidence interval estimates and tests of statistical hypotheses • Introduction to Hypothesis Testing • Writing hypotheses for statistical tests • One Sample, Independent Samples and Paired Samples t-tests • z-tests for proportion size 6. Use an appropriate method for analysing relationships between variables in a dataset • Relationship Modelling • Pearson's Correlation Co-efficient • Significance of the correlation co-efficient • Simple Linear Regression • Chi Square test for association • Chi Square test of goodness of fit During the Practical element of the course, students will use the Data Analysis ToolPak in Microsoft Excel and also Minitab to carry out the various types of analysis listed in the syllabus above.

Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	The teaching methods used will be a combination of online-lectures, self-study, online practical workshops, and any combination of discussion, case study, problem-solving exercises and computer-based learning. The practical element of the course will be delivered separately to students in their various class groups (Biomedical Science/Medical Biotechnology, Forensic Science, Pharmaceutical Science) so that the examples used in the practical application of statistics can be tailored to their field of study.

Student Workload (SWL) **الحمل الدراسي للطالب**			
Structured SWL (h/sem) **الحمل الدراسي المنتظم للطالب خلال الفصل**	40	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	2.666
Unstructured SWL (h/sem) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	20	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	1.333

Total SWL (h/sem) **الحمل الدراسي الكلي للطالب خلال الفصل**	60

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, and 3
	Assignments	2	10% (10)	7, 12	LO # 4 and 6
	Projects / Lab.	1	10% (10)	continuous	
	Report	1	10% (10)	14	LO # 5 and 7
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO # 1-5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	• Introduction to Statistical Terms • Populations and Samples
Week 2	• Statistical Description of Data
Week 3	• Graphical Representation of data including frequency tables and charts
Week 4	• Measures of Central Tendency , Arithmetic Mean, The Geometric Mean
Week 5	• The Median, The Mode
Week 6	• Measures of Dispersion , Variance and Standard Deviation
Week 7	• Introduction of Probability Theory • General Rule of Probability
Week 8	• Counting Rule
Week 9	• Bayes Theorem
Week 10	• The Normal Distribution • Applications of the standard Normal Distribution
Week 11	• Binomial Distribution • Poisson Distribution
Week 12	• Relationship Modelling • Pearson's Correlation
Week 13	• Simple Linear Regression

Week 14	• Introduction to Hypothesis Testing • Writing hypotheses for statistical tests
Week 15	• Chi Square Distribution • Chi Square test of goodness of fit
Week 16	**Preparatory week before the final Exam**

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

Learning and Teaching Resources **مصادر التعلم والتدريس**		
	Text	**Available in the Library?**
Required Texts	Practical Statistics for the Analytical Scientist	Yes
Recommended Texts	Essential Mathematics and Statistics for Science	No
Websites	www.mathhandbook.com	

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

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

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

	Ministry of Higher Education and Scientific Research - Iraq Al-Nahrain University College of Science Computer Science Department	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Programming Language			**Module Delivery**	
Module Type	Core			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	COMP1201				
ECTS Credits	10				
SWL (hr/sem)	250				
Module Level	1		**Semester of Delivery**	2	
Administering Department	Computer science		**College**	Science	
Module Leader	Dr. Hasnaa Imad Abdulsalam		**e-mail**	hasnaimad@nahrainuniv.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Haider Majeed Jaber		**e-mail**	haidermjaber@gmail.com	
Peer Reviewer Name	Dr. Tiba Zaki Abdulhameed		**e-mail**	tiba.zaki@nahrainuniv.edu.iq	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

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

<table>
<tr><th colspan="2">Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية</th></tr>
<tr><td>Module Aims
أهداف المادة الدراسية</td><td>1) Problem solving skills
a) Learning how to link and organize simple ideas
b) how to break down problems into logical pieces.
2) Being able to compare between various solution of the same problem
3) building simple applications.</td></tr>
<tr><td>Module Learning Outcomes

مخرجات التعلم للمادة الدراسية</td><td>The learning outcomes of a class on arrays, recursive methods, and CSV file reading can vary depending on the institution and the instructor, but some common outcomes include:

● Translate Algorithms that manipulate structured data to java code
● Identify an array,An array is a data structure that stores a collection of data elements of the same type.
● Write code to create and manipulate arrays compose previous programming skills to solve more complex problems

This includes being able to create arrays of different sizes, add and remove elements from arrays, and sort arrays.

● Understand the concept of a recursive method

A recursive method is a method that calls itself.

● Write code to implement recursive methods

This includes being able to write recursive methods to solve problems such as finding the factorial of a number or the Fibonacci sequence.

● Understand the concept of files, especially a CSV file

A CSV file is a file that stores data in a tabular format.

● Write code to read and write CSV files</td></tr>
<tr><td>Indicative Contents
المحتويات الإرشادية</td><td>The indicative content for a class on arrays, recursive methods, and CSV file reading might include the following topics:

● Arrays (1D, and 2D)
○ What is an array?
○ How to declare an array</td></tr>
</table>

	○ How to access elements of an array ○ How to add and remove elements from an array ○ How to sort an array ○ How to search array ● **Recursive methods** ○ What is a recursive method? ○ How to write a recursive method ○ How to use a recursive method to solve problems ● **CSV files** ○ What is a CSV file? ○ How to read data from a CSV file ○ How to write data to a CSV file

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main way this module will be taught is by encouraging students to participate in exercises, while also improving and expanding their critical thinking skills. This will be accomplished through lectures, interactive tutorials, and simple experiments that are interesting to the students. Here is a more detailed explanation of each point: ● **Encouraging student participation in exercises:** This will help students learn by doing and apply the concepts they are learning in a practical setting. ● **Improving and expanding critical thinking skills:** This will help students learn to think more deeply about the material and to come up with their own solutions to problems. ● **Lectures:** Lectures will provide students with the foundation they need to understand the material. ● **Interactive tutorials:** Interactive tutorials and discussions will allow students to practice the concepts they are learning in a safe environment. ● **Simple experiments:** Simple experiments will allow students to see the concepts they are learning in action.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	153	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	10.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	97	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	250		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)		All
	Assignments	2	10% (10)		All
	Projects / Lab.	1	20% (20)	Continuous	All
	Report	0			
Summative assessment	**Midterm Exam**	2 hr	10% (10)		All
	Final Exam	3hr	50% (50)		All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Ch6: Review loops (nested loops)

Week 2	Ch6: Characters , Which Loop to Use, String Iteration , The indexOf Method, Substrings, String Comparison , String Formatting HW 6.13 Exercises
Week 3	Ch7 Arrays and References Creating Arrays, Accessing Elements , Displaying Arrays
Week 4	Copying Arrays, Traversing Arrays
Week 5	Random Numbers , Building a Histogram.
Week 6	The Enhanced for Loop m, Counting Characters HW 7.11 Exercises
Week 7	Mid-term Exam
Week 8	2D arrays
Week 9	parallel arrays
Week 10	students and subjects table.(how to implement it)
Week 11	manipulation of 2D array
Week 12	Mid-term Exam
Week 13	8 Recursive Methods Recursive Void Methods, Recursive Stack Diagrams , Value-Returning Methods ,The Leap of Faith, Counting Up Recursively HW 8.10 Exercises
Week 14	Introducing files, CSV, (read and write)
Week 15	**General review**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: nested loops
Week 2	Lab 2: string and char manipulation.

Week 3	Lab 3: methods to Create Arrays, Accessing Elements , Displaying Arrays,print one Dimension array, sum, average.
Week 4	Lab 4:methods to Copy Arrays, Traverse Arrays
Week 5	Lab 5: Random Numbers , Building a Histogram.
Week 6	Lab 6: using array to display international telephone number
Week 7	Lab 7: Mid-term Exam
Week 8	Lab 8: solve mid term questions
Week 9	Lab 9: Histogram of customers distribution of ice-cream company
Week 10	(two dimensional array applications) TickTackToy
Week 11	Matrix operations
Week 12	Mid-term Exam
Week 13	Lab 13: recursive method (factorial, fibonacci, delete char from string, delete two consecutive chars using loops and then using recursive method) Binary Number System . Recursive Binary Method, CodingBat Problems .
Week 14	Lab 14: read csv file
Week 15	Lab 15: review

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Think Java: How to Think Like a Computer Scientist, 2 nd Edition, Version 7.1.0 Allen B. Downey and Chris Mayfield	free online
Recommended Texts	Introduction to Java Programming, Comprehensive Version, 10th Edition, by Y. Daniel Liang Head First Programming Head First Java	
Websites	Book's Website: https://books.trinket.io/thinkjava2/index.html https://codingbat.com/java https://www.codejava.net/java-se/file-io/how-to-read-and-write-text-file-in-java	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group	**A** - Excellent	امتياز	90 - 100	Outstanding Performance

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

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

Ministry of Higher Education and Scientific Research - Iraq
Al-Nahrain University
College of Science
Computer Science Department

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	Computation Theory	**Module Delivery**	
Module Type	C	☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	COMP2109		
ECTS Credits	6.0		
SWL (hr/sem)	150		
Module Level	3	**Semester of Delivery**	1
Administering Department	Computer Science	**College**	Science
Module Leader	Dr.Suhad A. Yousif	**e-mail**	
Module Leader's Acad. Title	Assistant Professor	**Module Leader's Qualification**	Ph.D. in Computer Science
Module Tutor		**e-mail**	Suhad.a.yousif@nahrainuniv.edu.iq
Peer Reviewer Name	Dr. Tiba Zaki	**e-mail**	
Scientific Committee Approval Date		**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	• Familiarize students with fundamental concepts in automata theory, formal languages, and Turing machines. • Investigate deterministic and non-deterministic finite automata, and their computational functions. • Grasp the essence of context-free grammars and their connection to computational models. • Examine pushdown automata and their use in parsing and recognizing languages. • Acquire knowledge about Turing machines and their importance in computability and complexity theory. • Offer a blend of theoretical knowledge and practical applications in computational theory. • Equip students to analyze computational problems and evaluate algorithmic procedures.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of this module, students will be able to: • Understand and explain the fundamental concepts of automata theory, formal languages, and computation models. • Differentiate between deterministic and non-deterministic finite automata and their practical applications. • Design and analyze regular expressions and finite automata for recognizing patterns and languages. • Define and work with context-free grammars (CFGs) and demonstrate their equivalence with pushdown automata. • Simplify context-free grammars and convert them to Chomsky Normal Form (CNF). • Analyze the computational power of Turing machines and understand their significance in computability theory. • Apply theoretical knowledge to solve computational problems and evaluate the complexity of algorithms. • Demonstrate an understanding of the limitations of various computational models, including regular and context-free languages.
Indicative Contents المحتويات الإرشادية	**Introduction to Computation Theory** • Overview of computation theory and its significance **Mathematical Foundations** • Sets, relations, and functions • Logic and proof techniques (induction, contradiction) **Finite Automata** • Definition and types (deterministic vs. nondeterministic) • Transition diagrams and state tables • Minimization of finite automata • Applications of finite automata **Regular Languages** • Definition and properties of regular languages • Regular expressions and their equivalence to finite automata • Closure properties of regular languages • Pumping lemma for regular languages

	Context-Free Languages • Definition and context-free grammars (CFGs) • Parse trees and derivations • Chomsky normal form and other forms of CFGs • Closure properties and pumping lemma for context-free languages **Pushdown Automata**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	

Strategies	• **Lectures:**
	  • Delivered to explain key theoretical concepts and their applications in automata theory, formal languages, and computation models.
	• **Interactive Discussions:**
	  • Engage students in discussions to deepen their understanding of complex topics such as non-deterministic finite automata, context-free grammars, and Turing machines.
	• **Problem-solving Sessions:**
	  • Students will participate in problem-solving exercises during class to apply theoretical concepts to practical computation problems.
	• **Assignments and Quizzes:**
	  • Regular assignments and quizzes will be provided to reinforce understanding and ensure continuous assessment of the learning outcomes.
	• **Group Projects:**
	  • Students will collaborate on group projects to explore real-world applications of automata theory and computational models, fostering teamwork and deeper understanding.
	• **Exams:**
	  • Midterm and final exams will assess students' grasp of theoretical concepts and their ability to apply them to solve computational problems.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Introduction to Automata, Computability, and Complexity (Sipser - Chapter 1)
Week 1	Basic Mathematical Notation and Techniques (Sipser - Chapter 1)
Week 2	Finite Automata - Definitions and Examples (Sipser - Chapter 1)
Week 3	Deterministic Finite Automata (DFA) (Sipser - Chapter 1) - Extended to Week 4
Week 4	Deterministic Finite Automata (DFA) (Sipser - Chapter 1)
Week 5	Nondeterministic Finite Automata (NFA) (Sipser - Chapter 1)
Week 6	Equivalence of DFA and NFA (Sipser - Chapter 1)
Week 7	Regular Expressions (Sipser - Chapter 1)
Week 8	Equivalence of Regular Expressions and Finite Automata (Sipser - Chapter 1) - Extended to Week 8
Week 9	Midterm Exam
Week 10	Context-Free Grammars (CFG) - Definitions and Examples (Sipser - Chapter 2)
Week 11	Simplification of Context-Free Grammars (Sipser - Chapter 2)
Week 12	Pushdown Automata (PDA) - Introduction and Definitions (Sipser - Chapter 2)
Week 13	Equivalence of Pushdown Automata and Context-Free Grammars (Sipser - Chapter 2)
Week 14	Equivalence of Pushdown Automata and Context-Free Grammars (Sipser - Chapter 2)
Week 15	Turing Machines - Introduction and Basic Definitions (Sipser - Chapter 2)

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Introduction To The Theory Of Computation - Michael Sipser	
Recommended Texts	https://cglab.ca/~michiel/TheoryOfComputation/TheoryOfComputation.pdf	
Websites	https://mog.dog/files/SP2019/Sipser_Introduction.to.the.Theory.of.Computation.3E.pdf	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

	Ministry of Higher Education and Scientific Research - Iraq Al-Nahrain University College of Science Computer Science Department	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	COMPUTER SKILLS I	**Module Delivery**	
Module Type	CORE		☐**Theory** ☐**Lecture** ☒**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**
Module Code	COMP2107		
ECTS Credits	3		
SWL (hr/sem)	75		

Module Level	3	**Semester of Delivery**	1
Administering Department	Computer Science Department	**College**	College of Sciences
Module Leader	Dr. dalal naeem hamood	**e-mail**	Dalal.naeem@ced.univnahrain.edu.iq
Module Leader's Acad. Title	Asst. Prof.	**Module Leader's Qualification**	PhD in Computer Science
Module Tutor		**e-mail**	
Peer Reviewer Name	Dr. Khamael Abbas Khudhair	**e-mail**	
Review Committee Approval	16/9/2024	**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. The main aim of the course is to introduce the students to the principles of Computer. 2. It focuses on explain the abbreviations of the computer 3. In this semester, focuses on the common skills for the computer application Such as word.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. To teach students how the use the computer . 2. To teach students how to use the application such as word 3. To teach students the working with windows 4. To teach students the working with word
Indicative Contents المحتويات الإرشادية	1. High Knowledge about Micro soft Office (Word + Excel + Power Point). 2. The ability of using these softwares through their academic journey.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	Book, lab, Quizzes & homework's.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.8
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**	1	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	1	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	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	
Week 16	

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	word processor"(create new file, open ,edit, save, save as) Lab 1
Week 2	word processor: (draw shapes, draw different flowchart) Lab 2
Week 3	word Processor: (insert header and footer, no. of page) Lab 3
Week 4	word processor:(Insert Equesion, insert symbol) Lab 4
Week 5	word processor:(insert Tables) Lab 5
Week 6	word processor"(Table Tools) Lab 6
Week 7	Mid 1 (Exam 1)
Week 8	Power Point (create new file, open ,edit, save, save as, font) Lab 7
Week 9	Power point (insert slide, remove slide, hide slide, master slide) Lab8
Week 10	power point(show, add timer, animation, used Template) Lab 9
Week 11	Excel (create new file, open ,edit, save, save as, font) Lab 10
Week 12	Excel (charts, sort , search, insert shape or image) Lab 11
Week 13	Excel (functions, filters) Lab 12
Week 14	Mid 2 (EXAM 2)
Week 15	**Preparatory Week**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**Introduction to computers** **Prter Norton** **Mc Grow Hill** **2017**	No
Recommended Texts	**MS tutorial**	
Websites	https://onlinestudy4u.wordpress.com/wp-content/uploads/2012/10/introduction-to-computers-by-peter-norton-6th-ed.pdf	

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:

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

	Ministry of Higher Education and Scientific Research - Iraq Al-Nahrain University College of Science Computer Science Department	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Data Structure			**Module Delivery**	
Module Type	Core			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**COMP2108**				
ECTS Credits	6.0				
SWL (hr/sem)	150				
Module Level	2		**Semester of Delivery**	1	
Administering Department	Computer science		**College**	Science	
Module Leader	Nadia Fadhil AL-Bakri		**e-mail**	Nadia.f.al-bakri@nahrainuniv.edu.iq	
Module Leader's Acad. Title	Assistant Prof.		**Module Leader's Qualification**	Ph. D.	
Module Tutor	Nadia Fadhil AL-Bakri		**e-mail**	Nadia.f.al-bakri@nahrainuniv.edu.iq	
Peer Reviewer Name	Ban N. Dhannoon		**e-mail**	ban.n.dhannoon@nahrainuniv.edu.iq	
Scientific Committee Approval Date	16/ 9/ 2024		**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	• **Preparing graduates with the experience in the basis of data structures and types.** • **Preparing graduates the optimal methods of storing data in the computer and transferring them.** • **Provides students high programming skills.** • **Enable students to draw flowchart for the problems on paper and screen.** • **Preparing the ability to understand the problems to be solved and to find the desired goal represented by the solution to these problems through data collection and analysis.**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• **Understand Key Data Structures: Define, explain, and apply fundamental data structures such as arrays, linked lists, stacks, queues, trees.** • **Implement Data Structures: Write efficient code to implement and manipulate data structures using programming languages like Java.** • **Select Appropriate Data Structures: Choose the most appropriate data structures to solve specific problems based on performance needs.**
Indicative Contents المحتويات الإرشادية	• **High Knowledge about data manipulations skills.** • **High programming following and tracing.** • **The ability of implementing different data structures based on java.**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• **Problem solving Learning.** • **Deliver detailed explanations of key data structures.** • **Collaborative Learning.** • **Implementation of data structures showing step-by-step how to build and manipulate them in code.** • **Providing the HW solution for all.**

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	1	10% (10)	10	All
	Assignments	1	10% (10)	12	All
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	All
Summative assessment	**Midterm Exam**	2 hr	10% (10)		All
	Final Exam	3 hr	50% (50)		All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	• Data structure definitions • Linear and nonlinear data structure. • Primitive data types • Expressions • Type conversion
Week 2	• String manipulation • Flowchart constructions
Week 3	Recursion Functions
Week 4	Dynamic programming
Week 5	ADT (Bag, Queue, Stack)
Week 6	Circular Queue
Week 7	Stack applications
Week 8	First mid exam
Week 9	converting infix form to postfix form Algorithm
Week 10	• Linear List and Linked Allocation • Operations for S.L.L.L
Week 11	Double-Ended Lists
Week 12	Double linked linear list (D.L.L.L.)
Week 13	D.L.L.L Operations
Week 14	Second mid exam
Week 15	D.L.L.L. as a queue

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Assignments of Primitive data types and simple programs. Assignments of Expressions Type conversion.
Week 2	Strings Assignments.
Week 3	Recursion Functions Assignments.
Week 4	Dynamic programming Assignments.
Week 5	ADT (Bag) Assignments.
Week 6	ADT (Queue) Assignments.
Week 7	ADT (Stack) Assignments.
Week 8	Circular Queue Assignments.
Week 9	First mid exam
Week 10	Linear List and Linked Allocation Assignments Operations for S.L.L.L Assignments
Week 11	Double-Ended Lists Assignments
Week 12	Double linked linear list (D.L.L.L.) Assignments
Week 13	D.L.L.L Operations Assignments
Week 14	D.L.L.L. as a queue Assignments
Week 15	Second mid exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Providing high-quality printed paper lectures that cover the entire subject with exercises	available
Recommended Texts	**Textbook:** 1-**Data Structures and Algorithms in Java™** Sixth Edition 2014 Michael T. Goodrich Roberto Tamassia Michael H. Goldwasser 2-**Data Structures And Algorithms Made Easy In JAVA 2017**	

	Narasimha Karumanchi	
Websites	1-**Data Structures and Abstractions with Java** Fifth Edition 2019 Frank M. Carrano,Timothy M. Henry 2-**Cracking *The* Coding Interview** 6th edition 2015 Gayle Laakmann Mcdowell	

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

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

	Ministry of Higher Education and Scientific Research - Iraq Al-Nahrain University College of Science Physics Department	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	مادة اللغة الانكليزية			**Module Delivery**	
Module Type	BASIC			☒**Theory** ☐**Lecture** ☐**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	URENG2				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		3	**Semester of Delivery**		1
Administering Department		Department of Computer Sciences	**College**	College of Sciences	
Module Leader	Assist. Lect. Israa Namh Abdula		**e-mail**	israa.alsultani@nahrainuniv.edu.iq	
Module Leader's Acad. Title		Assistant Lecturer	**Module Leader's Qualification**		M. A.
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name		Dr. Khamael Abbas Khudhair	**e-mail**	None	
Review Committee Approval		16/9/2024	**Version Number**		1.0

<table>
<tr><th colspan="4">Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى</th></tr>
<tr><td>Prerequisite module</td><td>None</td><td>Semester</td><td></td></tr>
<tr><td>Co-requisites module</td><td>None</td><td>Semester</td><td></td></tr>
<tr><th colspan="4">Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية</th></tr>
<tr><td>Module Aims
أهداف المادة الدراسية</td><td colspan="3">1. Developing Basic Communication Skills:
- Enable students to express themselves effectively in everyday situations.
- Focus on building a foundation in speaking and listening.
2. Enhancing Reading Comprehension:
- Improve students' ability to understand and interpret written texts.
- Introduce strategies for effective reading comprehension.
3. Strengthening Writing Proficiency:
- Develop students' writing skills across different genres (e.g., essays, emails, reports).
- Emphasize grammar, sentence structure, and vocabulary usage.
4. Listening Skills Development:
- Improve students' ability to comprehend spoken English in various contexts.
- Provide exposure to different accents and speaking speeds.
5. Effective Presentation Skills:
- Equip students with the skills to deliver clear and engaging presentations.
- Focus on aspects such as organization, delivery, and visual aids.</td></tr>
<tr><td>Module Learning Outcomes

مخرجات التعلم للمادة الدراسية</td><td colspan="3">1. Students will demonstrate the ability to initiate and sustain simple conversations in English.
2. Students will be able to deal with the basics of English language Grammar.
3. Students will enhance their knowledge of pathology-related vocabulary.
4. Students will be able to ask and respond to basic questions related to personal information, daily activities, and immediate surroundings.
5. Students will exhibit improved reading comprehension by accurately summarizing and analyzing information from a variety of texts.
6. Students will deliver clear and organized presentations using appropriate language and visuals.</td></tr>
<tr><td>Indicative Contents
المحتويات الإرشادية</td><td colspan="3">Advanced Communication Skills:
• Greetings and introductions
• Describing daily routines

Reading Comprehension:
• Reading stories and articles</td></tr>
</table>

	• Comprehension exercises with questions Writing Proficiency: • Article writing • Summarizing various texts Vocabulary Expansion: • Everyday vocabulary • Academic vocabulary Listening Skills Development: • Listening to dialogues and conversations • Podcasts and audio materials
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Emphasize interactive and communicative activities to engage students actively in the learning process • Design tasks that require students to use English to accomplish specific goals, fostering language use in context. • Recognize and accommodate diverse learning styles and paces within the classroom. • Incorporate authentic materials like newspaper articles, blogs, or videos to expose students to real-life language use. • Implement ongoing formative assessments, such as quizzes, peer evaluations, and class discussions, to gauge student progress. • Provide constructive feedback on both spoken and written language, and encourage students to reflect on their learning experiences • Adapt lesson plans based on the evolving needs and interests of the students, allowing for flexibility in the teaching approach.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	1	10% (10)	5, 10	LO # 2, 1, 5
	Report	1	10% (10)	11	LO # 1,6
	Assignments	1	10% (10)	10-14	
	Presentation	1	10% (10)	14	LO # 6
Summative assessment	**Midterm Exam**	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to the course, syllabus, and expectations.
Week 2	Unit One of the textbook: Tenses – writing formal e-mails
Week 3	Unit Two of the textbook: Describing objects and people – Collocations
Week 4	Grammar: Irregular verbs- making connections with words
Week 5	Writing Skills: Basics of academic writing
Week 6	Reading Comprehension: Reading extracts from a novel+ discussions
Week 7	**Mid-Exam**
Week 8	Unit Three of the textbook: Quantity – Articles – Technology-related vocabulary part1
Week 9	Writing basics: Summarizing texts – how to extract information from various texts
Week 10	Grammar: Passive and active voice- Reported speech
Week 11	Listening skill: Listening to a podcast- discussions
Week 12	Speaking skill: Exchanging and discussing information about DNA and Google
Week 13	Unit Four of the textbook: Technology-related vocabulary part2 - Comparative and superlative adjectives
Week 14	Writing and talking about personal interests. -Group activity: planning a class event based on shared interests.
Week 15	**final exam preparation**

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	New Headway Plus: Pre-intermediate	Yes
Recommended Texts	Selected Novel	
Websites	www.youtube.com (short videos+ chosen movies)	

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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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:				

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

	Ministry of Higher Education and Scientific Research - Iraq Al-Nahrain University College of Science Computer Science Department	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Object Oriented Programming			**Module Delivery**	
Module Type	Core			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	COMP2105				
ECTS Credits	6.0				
SWL (hr/sem)	150				
Module Level	3		**Semester of Delivery**	1	
Administering Department	Computer Science		**College**	Science	
Module Leader	Abeer Khalid Al-Mashhadany		**e-mail**	aabeeeeraa@yahoo.com	
Module Leader's Acad. Title	Assistant Prof.		**Module Leader's Qualification**	M.Sc in Computer Science	
Module Tutor	Abeer Khalid Al-Mashhadany		**e-mail**	aabeeeeraa@yahoo.com	
Peer Reviewer Name	Hana Muhammad		**e-mail**	Hhhhh55mm@yahoo.com	
Scientific Committee Approval Date	16 / 9/ 2024		**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	• **Give all principles of Object Oriented Programming** • **Train to use OOP principles to solve Real problems** • **Provides students high programming skills** • **Enable students to make design on paper** • **Enable student to trace the run operation**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• **Differences of object oriented programming from Structured Programming** • **Why object oriented programming and its advantages** • **Relate object oriented programming principles with its real life examples.** • **Object oriented programming in Java programming language. It helps stud training to configure errors and imagine how to correct it.** •
Indicative Contents المحتويات الإرشادية	• **High programming skills** • **High programming following and tracing** • **Force ability of design projects based on OOP** • **Face ability of suggesting relationships and drawing block diagram bef starting writing code.**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• **Pre Info required** • **Oral Lectures** • **Presentation Lectures** • **Train on White Board** • **Explain Lab Ass. Oral and on white board** • **Train at Lab** • **Home Work to a specific group** • **Providing the HW solution for all**

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	1	10% (10)	10	All
	Assignments	1	10% (10)	12	All
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	All
Summative assessment	**Midterm Exam**	2 hr	10% (10)		All
	Final Exam	4 hr	50% (50)		All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**Pre-Info. Programming Fundamentals** • **Introduction to Object Oriented Programming** • **Input & Output Statements.** • **Control Statements.** • **Methods & Methods Overloading** • **Loops** • **One Dimensional Array –Vector** • **Two Dimensional Array** • **Computer Organization Aided Programming**
Week 2	**Classes and Objects** • **Designing a Class** • **Creating Objects from Classes** • **Access Modifiers: Public and Private**
Week 3	**Pointers and Packages**
Week 4	**Constructors, Using this keyword**
Week 5	**Composition**
Week 6	**Finalize, Static, and Final** • **Garbage Collection** • **Static Variables & Static Methods** • **Static Import** **Final Instance Variables**
Week 7	First Mid Exam
Week 8	**Enumerations**
Week 9	**Inheritance & Protected Access** • **Introduction** • **Calling Superclass Constructors** • **Overriding Methods**
Week 10	**Inheritance : Overriding Methods**
Week 11	**Second Mid Exam**
Week 12	**Polymorphism : Operator instanceof and Downcasting**
Week 13	**Abstract Class**
Week 14	**Interfaces**
Week 15	**Work as teem**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	**Pre-Info. Programming Fundamentals** • **Introduction to Object Oriented Programming** • **Input & Output Statements.** • **Control Statements.** • **Methods & Methods Overloading** • **Loops** • **One Dimensional Array –Vector** • **Two Dimensional Array** • **Computer Organization Aided Programming**
Week 2	**Classes and Objects** • **Designing a Class** • **Creating Objects from Classes** **Access Modifiers: Public and Private**
Week 3	**Pointers and Packages**
Week 4	**Constructors, Using this keyword**
Week 5	**Composition**
Week 6	**Finalize, Static, and Final** • **Garbage Collection** • **Static Variables & Static Methods** • **Static Import** **Final Instance Variables**
Week 7	First Mid Exam
Week 8	**Enumerations**
Week 9	**Inheritance & Protected Access** • **Introduction** • **Calling Superclass Constructors** **Overriding Methods**
Week 10	**Inheritance : Overriding Methods**
Week 11	**Second Mid Exam**
Week 12	**Polymorphism : Operator instanceof and Downcasting**
Week 13	**Abstract Class**
Week 14	**Interfaces**
Week 15	**Work as teem**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Providing high-quality printed paper lectures that cover the entire subject with exercises	available
Recommended Texts	Textbook: Java Concepts, Cay Horstmann, San Jose State University.	
Websites	Providing high-quality printed paper lectures that cover the entire subject with exercises	

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

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

	Ministry of Higher Education and Scientific Research - Iraq Al-Nahrain University College of Science Computer Science Department	

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Structured Programming			**Module Delivery**	
Module Type	Elective			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	COMP2106				
ECTS Credits	6.0				
SWL (hr/sem)	150				
Module Level	3		**Semester of Delivery**	1	
Administering Department	Computer science		**College**	Science	
Module Leader	Dr. Ghassan Abdulhakeem		**e-mail**	Ghassan.alnuaimi@nahrainuniv.edu.iq	
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Ehsan Qahtan, Zainab Haider		**e-mail**		
Peer Reviewer Name	Dr. Jamal Mohamad		**e-mail**		
Scientific Committee Approval Date			**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	• Understand fundamental concepts of structured programming. • Make programs easier to comprehend from a reader's point of view. • Improve the clarity, quality, and development time of a computer program. • Discover new tools and data structure in C language that assist building a wide variety of programs.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Develop a C programs • Control the sequence of the program and give logical outputs • Deal with different data types. • Manage I/O operations in your C program • Repeat the sequence of instructions and points for a memory location • Apply code reusability with functions and pointers • Implement strings in your C program • Understand the basics of file handling mechanisms • Explain the uses of pre-processors and various memory models
Indicative Contents المحتويات الإرشادية	• Definition and principles of structured programming • Importance of structured programming in software development • Data types and variables • Operators and expressions • Input and output operations

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Weekly lectures, PowerPoint slides, group discussion and weekly tasks • Following the teaching strategies in the class, providing digital material, and students engagement during the lecture.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	7, 14	All
	Assignments	1	10% (10)	15	All
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	All
Summative assessment	**Midterm Exam**	2 hr	10% (10)	10	All
	Final Exam	4 hr	50% (50)		All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to structured programming, fundamentals of C language.
Week 2	Variables, data types and arithmetic expressions.
Week 3	Program Loops: for, nested loops, while, do, break, continue
Week 4	Conditional Statements: if, if-else, nested if, else if, switch, conditional operator
Week 5	Arrays (One dimensional arrays): The concept of array, defining arrays, initializing arrays.
Week 6	Arrays (Two dimensional arrays): Defining multidimensional arrays, Variable length array.
Week 7	Functions: Defining a function, calling a function, arguments, local variables, returning function results, declaring a function prototype.
Week 8	Functions: Global variables, nested functions.
Week 9	Strings: Characters and arrays, initializing, operations on strings.
Week 10	Mid exam
Week 11	Structures in C language.
Week 12	Pointers: Pointers and addresses, pointers and function arguments.
Week 13	Pointers and arrays, pointer arithmetic, pointers and strings, dynamic memory allocation
Week 14	Working with files.
Week 15	Continue working with files.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Writing the first C program.
Week 2	Get used to variables, data types and arithmetic expressions.
Week 3	Writing programs using different types of loops.
Week 4	Programs with conditional statements and switch.
Week 5	Building programs with one dimensional array.
Week 6	Building programs with two dimensional arrays.
Week 7	Building programs that implying functions.
Week 8	Building programs that implying nested functions.
Week 9	Building programs with Strings
Week 10	Mid exam
Week 11	Implying structures in the program.
Week 12	Building programs with pointers – Part 1.
Week 13	Building programs with pointers – Part 2.
Week 14	Creating files in C.
Week 15	Read & Write operations on files.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Stephen G. Kochan, Programming in C, Developer's Library, Third Edition, 2005, ISBN-13: 978-0-672-32666-0.	No
Recommended Texts	H Schildt, "C the complete reference", Fourth Edition, 2000	No.
Websites	**http://debracollege.dspaces.org/bitstream/123456789/78/1/C%20The%20Complete%20Reference%20by%20Herbert%20Schildt.pdf**	

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

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

	Ministry of Higher Education and Scientific Research - Iraq Al-Nahrain University College of Science Computer Science Department	

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Algorithm design and analysis			**Module Delivery**	
Module Type	Core			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**COMP2211**				
ECTS Credits	6.0				
SWL (hr/sem)	150				
Module Level	3		**Semester of Delivery**	2	
Administering Department	Computer science		**College**	Science	
Module Leader	Nadia Fadhil AL-Bakri		**e-mail**	Nadia.f.al-bakri@nahrainuniv.edu.iq	
Module Leader's Acad. Title	Assistant Prof.		**Module Leader's Qualification**	Ph. D.	
Module Tutor	Nadia Fadhil AL-Bakri		**e-mail**	Nadia.f.al-bakri@nahrainuniv.edu.iq	
Peer Reviewer Name	Ban N. Dhannoon		**e-mail**	ban.n.dhannoon@nahrainuniv.edu.iq	
Scientific Committee Approval Date	16/ 9/ 2024		**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	• **Implementation of multiple algorithms, the purpose of which is to see these algorithms and show the best ones in terms of speed of implementation.** • **A student is also prepared with the ability to understand soring and searching methods.** • **Provides students high programming skills.** • **Enable students to write algorithms for the problems on paper and screen.** • **Preparing the ability to understand the problems to be solved and to find the desired goal represented by the solution to these problems through calculating the algorithm complexity.**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• **Understand Key of algorithm designs: Define, explain, and apply fundamental steps for building.** • **Implement sorting and searching techniques: Write efficient code to implement and manipulate data structures using programming languages like Java.** • **Select Appropriate Data Structures: Choose the most appropriate data structures to solve specific problems based on performance needs.**
Indicative Contents المحتويات الإرشادية	• **High Knowledge about data manipulations skills.** • **High programming following and tracing.** • **The ability of implementing different techniques based on java.**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• **Problem solving Learning.** • **Deliver detailed explanations of key algorithm design.** • **Collaborative Learning.** • **Report requirements for new techniques.** • **Providing the HW solution for all.** • **The ability to use Java language, and applying the theory fundamentals and its use in different algorithms.** • **Improve the student's analysis and conclusion capabilities**

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	1	10% (10)	10	All
	Assignments	1	10% (10)	12	All
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	All
Summative assessment	**Midterm Exam**	2 hr	10% (10)		All
	Final Exam	4 hr	50% (50)		All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Algorithm fundamental and Properties
Week 2	• Analysis of an Algorithm • Algorithm Complexity
Week 3	• How to Determine Complexities • Searching methods
Week 4	Binary Tree construction
Week 5	Tree Traversals
Week 6	Mid1
Week 7	Deletion Methods in a Binary Tree
Week 8	Sorting Methods Definitions
Week 9	Bubble Sort,
Week 10	Selection Sort
Week 11	Insertion sort
Week 12	Merge Sort Methods
Week 13	Mid 2
Week 14	Shell Sort
Week 15	Quick Sort

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Assignments of programs in java
Week 2	Linear Search Algorithm
Week 3	Binary Search Algorithm
Week 4	Binary Tree implementation in java
Week 5	Tree Traversals Implementation in java
Week 6	Mid1
Week 7	Methods of Deletion in a Binary Tree implementation in java
Week 8	Sorting Methods Preparations and Implementation in java
Week 9	Bubble Sort Implementation in java
Week 10	Selection Sort Implementation in java
Week 11	Insertion Sort Implementation in java
Week 12	Merge Sort Methods Implementation in java
Week 13	Mid 2
Week 14	Shell Sort Implementation in java
Week 15	Quick Sort Implementation in java

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Providing high-quality printed paper lectures that cover the entire subject with exercises	available
Recommended Texts	**Textbook:** Algorithms, **Fourth Edition** / Robert SedgewickandKevin Wayne, Princeton University, Addison-Wesley 2011 Data Structures and Algorithms in Java™, Sixth Edition, Michael T. Goodrich,Roberto Tamassia, and Michael H. Goldwasser, Wiley, 2014	
Websites		

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

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

	Ministry of Higher Education and Scientific Research - Iraq Al-Nahrain University College of Science 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** ☒**Lab** ☒**Tutorial** ☐**Practical** ☒**Seminar**	
Module Code	COMP2212				
ECTS Credits	5				
SWL (hr/sem)	**64**				
Module Level	2		**Semester of Delivery**	2	
Administering Department	Computer science		**College**	Science	
Module Leader	Khamael Al-Dulaimi		**e-mail**	khamail.abbass@nahrainuniv.edu.iq	
Module Leader's Acad. Title	Assi. Prof		**Module Leader's Qualification**	Dr.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**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. This unit delivers an understanding the concepts of computer graphics which is the creation of pictures with the help of a computer. The end product of the computer graphics is a picture it may be a business graph, drawing, and engineering. 2. We focus on specific areas of study include the definition of computer graphics; applications of computer graphics; scan conversion a line; scan conversion circle; scan converting Ellipse; Filled Area Primitives; 2D Transformations; and Clipping Techniques 3. Examples and exercises demonstrate the use JAVA and functionality.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Develop and demonstrate a basic knowledge and understanding of computer graphics 2. Understand and apply various methods of generating, storing, transmitting and manipulating digital images. 3. Apply some open applications that related to the market
Indicative Contents المحتويات الإرشادية	
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Teamwork: Dividing the class into groups to complete a task is a teaching strategy that does wonders. 2. Inquiry-Based Teaching: Encouraging learners to ask a lot of questions is an effective teaching strategy that does not only motivate students to think more practically but also helps them to become independent learners. 3. Implementing Technology in the Classroom: The productive use of technological tools as active learning strategies in educational institutions may develop a vibrant learning community, help educators prepare and improve their lesson plans.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.06
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%	5, 10	
	Assignments	2	5%	2, 11	
	Projects / Lab.		15%		
	Report	2	5%	14	
Summative assessment	Midterm Exam	2 hr	10%	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	What is computer Graphics?, Area of Computer Graphics, Design and Drawing, Packages applications, Simulation,
Week 2	Application of Computer Graphics, How are pictures actually stored and displayed, Difficulties for displaying pictures.
Week 3	Point Plotting Techniques, Qualities of good line drawing algorithms
Week 4	Bresenham's Algorithm Digital Differential Analyzer (DDA)
Week 5	Generation of Circle, Draw a circle using Polynomial Method, and Bresenham's Algorithm
Week 6	What is transformation?, Matrix representation of points, Basic transformation, Rotation, reflection, scaling and Translation.
Week 7	Mid Exam
Week 8	Define Clipping and Windowing, Line Clipping Algorithms, the midpoint subdivision Method, Other Clipping Methods, and Viewing Transformations .
Week 9	What is 2D animation, Animation visual changes, Application Areas of Animation, and Animation functions.
Week 10	Graphical Input Techniques, Positioning Techniques, Positional Constraints, Rubber band Techniques
Week 11	Need for 3-Dimensional Imaging, Techniques for 3-Dimesional displaying, Parallel Projections, Perspective projection, Intensity cues, three Dimensional transformation,

	Translations, Scaling, Rotation, Viewing Transformation.
Week 12	hidden surface removal, The Depth - Buffer Algorithm, , Scan Line coherence algorithm,
Week 13	Span - Coherence algorithm, Area-Coherence Algorithms
Week 14	Warnock's Algorithm, and Priority Algorithms
Week 15	Mid Exam-2
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Preparing Java for Graphics
Week 2	Lab 2: Point Plotting Techniques, Qualities of good line drawing algorithms,
Week 3	Lab 3: Draw Lines
Week 4	Lab 4: Draw circles
Week 5	Lab 5: Transformation
Week 6	Lab 6: Clipping
Week 7	Lab 7: Mid Exam
Week 8	Lab 8: Animation
Week 9	Lab 9: Project

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Computer Graphics for Java Programmers by Leen Ammeraal, Kang Zhang Springer International Publishing AG 2017 Interactive computer graphics: a top-down approach using OpenGL by Angel, Edward 2008, 5th Int. ed.	

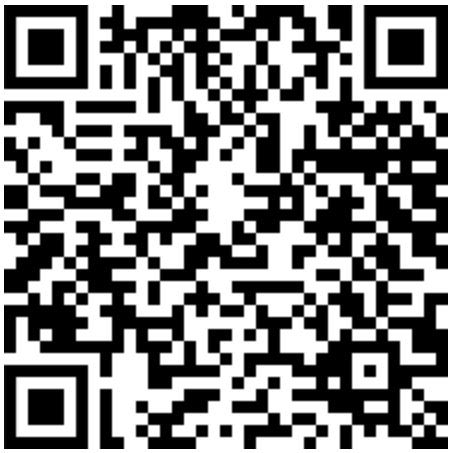
Recommended Texts		
Websites	Tutorial https://www.javatpoint.com/computer-graphics-tutorial	

APPENDIX:

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

Note:

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



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 Al-Nahrain University College of Science Computer Science Department	

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Computer Skills IV – Introducing Linux			**Module Delivery**	
Module Type	Compulsory			☐ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	COMP2207				
ECTS Credits	3.0				
SWL (hr/sem)	75				
Module Level	2		**Semester of Delivery**	2	
Administering Department	Computer science		**College**	Science	
Module Leader	Dr. Jamal Mohammed Kadhim		**e-mail**	Jamal.mohammedkadhim@nahrainuniv.edu.iq	
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Dr. Rasool Hisham, Dr. Ghassan, Zahraa Abdulhussain		**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**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	• Understand fundamental concepts of Linux operating system. • Make students familiar with non-windows platform. • Prepare students to open-source community. • Working with security principles in Linux operating system.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Discover Operating System's filing system. • Creating different users with different privileges. • Dealing with files and directories. • Dealing with BASH command Shell. • Searching in files. • Dealing with Linux GUI.
Indicative Contents المحتويات الإرشادية	• Importance of dealing with BASH. • Importance of dealing with open-source community. • Importance of writing scripts in Linux.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Weekly lectures, PowerPoint slides, group discussion and weekly tasks • Following the teaching strategies in the class, providing digital material, and students engagement during the lecture.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.8
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**	2	10% (10)	7, 14	All
	Assignments	1	10% (10)	15	All
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	All
Summative assessment	**Midterm Exam**	2 hr	10% (10)	10	All
	Final Exam	4 hr	50% (50)		All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	What is Linux? What is Linux Disro.? Installing Virtual Box. Installing Linux
Week 2	- Exploring Dolphin (File Manager) Dealing with Files and folders (i.e., creating, editing, copying, and deleting) - Exploring Add/Remove Software through Discover (general view), and how to launch it. - How to add a keyboard shortcut to an installed software.
Week 3	Exploring adding software to main panel, in addition to creating keyboard shortcut. - How to add a new user account. - How to understand user's and administrator's privileges, and how to modify these privileges. - Logout from and log into these accounts.
Week 4	System Monitor, Libreoffice, Konsole, Introducing BASH, date command, cal command pwd command, ls command, relative and absolute path names, cd command, using TAB in editing
Week 5	More on ls : ls -Shat, file command, less command, Exploring system directories
Week 6	Manipulating Files and Directories cp, mkdir, mv, rm
Week 7	Mid Exam #1
Week 8	Redirection
Week 9	Permissions
Week 10	Package Management
Week 11	Mid Exam#2
Week 12	Searching for files
Week 13	Archiving and backup
Week 14	Archiving and backup

Week 15	Archiving and backup

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	منهج النظري نفسه للعملي وذلك لان المادة عملي فقط
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	The Linux Command Line, Fifth Internet Edition, by William Shotts.	No
Recommended Texts		
Websites		

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

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

	Ministry of Higher Education and Scientific Research - Iraq Al-Nahrain University College of Science Computer Science Department	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	APPLIED NUMERICAL METHODS			**Module Delivery**	
Module Type	CORE			☒**Theory** ☒**Lecture** ☒**Lab** ☒**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code					
ECTS Credits	4				
SWL (hr/sem)	4				
Module Level			**Semester of Delivery**		
Administering Department	Computer Science		**College**	College of Science	
Module Leader	Abdulkareem Merhej Radhi		**e-mail**	Abdulkareemradhi@gmail.com	
Module Leader's Acad. Title	Prof.		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Abdulkareem Merhej Radhi		**e-mail**	abdulkareemradhi@gmail.com	
Peer Reviewer Name	Abdulkareem Merhej Radhi		**e-mail**		
Review Committee Approval			**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. Defining how to use numerical analysis to solve mathematical equations and complex problems with the simplest and fastest algorithms. 2. As well as analyzing errors resulting from mathematical operations to obtain highly accurate results. 3. As well as how to use the computer to solve mathematical problems using the Java language.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- The study of this subject aims to introduce the basics of the subject of applying numerical analysis methods, as it is the basis and mathematical background for other scientific subjects, such as information security, databases, as well as data structures in addition to the subject of data encryption. 2- Acquiring the skill of using the computer to simplify the procedure of complex mathematical operations, solve mathematical equations and extract results accurately.
Indicative Contents المحتويات الإرشادية	- The practical aspects of the lab include introducing the Java language and how to use it to write programs that include converting and translating numerical analysis algorithms and applying them to solve complex mathematical equations that require calculations that take a lot of time and effort.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	..... 1. Encourage students to take important, practical and organized notes during lectures. Encourage them to discuss and ask questions about the theoretical material. 2. Provide practice questions and participate in solving exercises. 3. .Interact with students in class participation in the lecture. 4. .Use books, online resources and supplementary materials to enhance learning. 5. Provide constructive feedback on assignments and assessments. 6. Teaching Strategies: 7. -Encourage students to interact actively with the material through discussions to enhance deep understanding of the material. 8. -Provide well-organized lectures that provide a clear overview of the topic. 9. -Assign important issues as homework and use lecture time for discussions. .....

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	20% (20)	5, 10	
	Assignments	2	10% (10)	2, 11	
	Projects / Lab.				
	Report	2	10% (10)	14	
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
الأسبوع الاول	مقدمة عن اهداف التحليل العددي و كيفية أستخدام الخوارزميات لحل المشاكل الرياضية المعقدة. والتعرف على كيفية تحليل الأخطاء.
الأسبوع الثاني	حل المعادلات اللاخطية بأستخدام طريقة التنصيف.
الأسبوع الثالث	حل المعادلات اللاخطية بأستخدام طريقة النقطة الثابتة وطريقة نيوتن وطريقة القاطع.
الأسبوع الرابع	دراسة خوارزميات الأستقراء والتقريب لغرض حل المعادلات الخطية.
الأسبوع الخامس	دراسة طرق التكامل لحل المعادلات الخطية.
الأسبوع السادس	فهم وأستيعاب التكامل العددي
الأسبوع السابع	امتحان منتصف الفصل
الأسبوع الثامن	طريقة كاوس لحل المعادلات الخطية
الأسبوع التاسع	طريقة رانج –كوتا لحل المعادلات التفاضلية.

الأسبوع العاشر	حل منظومة من المعادلات الخطية واللاخطية
الأسبوع الحادي عشر	طريقة نيوتن لحل المعادلات الخطية
الأسبوع الثاني عشر	مقدمة عن المصفوفات
الأسبوع الثالث عشر	دراسة أستخدام المصفوفات في حل المعادلات الخطية
الأسبوع الرابع عشر	طريقة الحذف لكاوس في حل المعادلات الخطية
الأسبوع الخامس عشر	الاسبوع التحضيري قبل الامتحان النهائي
الأسبوع السادس عشر	الامتحان النهائي

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	What are the contributions of numerical analysis in error analysis and solving complex mathematical problems and equations?
Week 2	Defining how to use numerical analysis to solve mathematical equations and complex problems with the simplest and fastest algorithms.
Week 3	As well as analyzing errors resulting from mathematical operations to obtain highly accurate results.
Week 4	Defining the basics of the subject of applying numerical analysis methods, as it is the basis and mathematical background for other scientific subjects, such as information security, databases, as well as data structures in addition to the subject of data encryption.
Week 5	Solving linear and nonlinear equations using the bisection method.
Week 6	Using numerical analysis methods to find integration and differentiation
Week 7	Using matrices to solve linear equations

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**Text book:** Numerical analysis for scientists and engineers	No

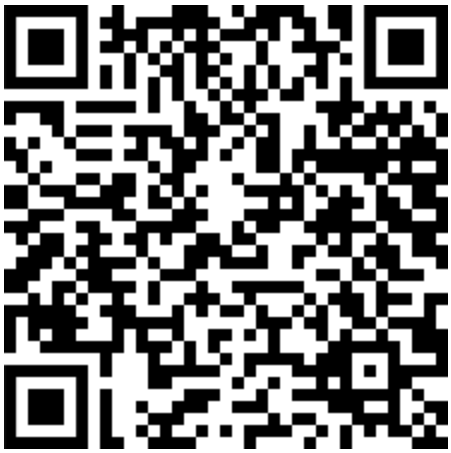
	Author : Joe Hoffman **Edition & Year public :** 2004	
Recommended Texts	• **Introduction to Numerical Methods**	No
Websites	• **http://www.mhhe.com/rosen**	

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:

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



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
Al-Nahrain University
College of Science
Computer Science Department

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	Systems Programming	**Module Delivery**	
Module Type	Core		☒Theory ☐Lecture ☒Lab ☐Tutorial ☐Practical ☐Seminar
Module Code			
ECTS Credits	6.0		
SWL (hr/sem)	150		

Module Level	2	**Semester of Delivery**	2
Administering Department	Computer science	**College**	Science
Module Leader	Dr. Sawsan Kamal Thamer	**e-mail**	Sawsan.kamal@nahrainuniv.edu.iq
Module Leader's Acad. Title		**Module Leader's Qualification**	
Module Tutor	Hayder Majeed, Ruaa AbdulAllah	**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date		**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	• Study the types of system software • Understand the way that each system program works • The connection among system software that complete the computer work
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Develop a C programs • Understand the importance of system programming • Study the types of system software and their role in system operations. • Study the types of windows and file system.
Indicative Contents المحتويات الإرشادية	• Principles of systems programming • Importance of structured programming in software development

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Weekly lectures, PowerPoint slides, group discussion and weekly tasks • Following the teaching strategies in the class, providing digital material, and students engagement during the lecture.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	7, 14	All
	Assignments	1	10% (10)	15	All

	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	All
Summative assessment	**Midterm Exam**	2 hr	10% (10)	10	All
	Final Exam	4 hr	50% (50)		All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1 & 2	Introduction to Software, Application Software, System Software , System Software Examples
Week 3	Operating System, Shell, BIOS
Week 4	Hupervisors
Week 5	Interrupts (Hardware & Software) Executing Software Interrupts
Week 6 & 7	Language processors
Week 8	Addressing modes
Week 9 & 10	Assembler (with all its details)
Week 11	Macros and Subprograms
Week 12	Linkers (Static & Dynamic Linkers), Loaders
Week 13 & 14	Text editor
Week 15	Debugger

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1 & 2	Read a string char by char then display it
Week 3 & 4	Separate the sentence into distinct words
Week 5	Store the words in different lines
Week 6	recognize the desired word from set of keywords
Week 7	Execute the recognized command

Week 8	Mid Exam 1
Week 9	Check syntax error in the input line command
Week 10 & 11	Call the suitable function for each command
Week 12	Read an input from keyboard using interrupts
Week 13	Print a string on the screen using interrupt
Week 14	Mid exam 2
Week 15	Review about all the course work

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Stephen G. Kochan, Programming in C, Developer's Library, Third Edition, 2005, ISBN-13: 978-0-672-32666-0.	No
Recommended Texts	H Schildt, "C the complete reference", Fourth Edition, 2000	No.
Websites	**http://debracollege.dspaces.org/bitstream/123456789/78/1/C%20The%20Complete%20Reference%20by%20Herbert%20Schildt.pdf**	

Grading Scheme مخطط الدرجات				
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