Ministry of Higher Education and Scientific Research Scientific supervisio
evaluation device
Department of Quality Assurance
and Academic Accreditation
Accreditation Department

Academic Program and course description guide

2024

Introduction:

The educational program is considered a coordinated and organized package of academic courses that includes procedures and experiences organized in the form of academic vocabulary, the main purpose of which is to build and refine the skills of graduates, making them qualified to meet the requirements of the labor market. It is reviewed and evaluated annually through internal or external audit procedures and programs such as the external examiner program.

The description of the academic program provides a brief summary of the main features of the program and its courses, indicating the skills that students are working to acquire based on the objectives of the academic program. The importance of this description is evident because it represents the cornerstone of obtaining program accreditation, and the teaching staff participates in writing it under the supervision of the scientific committees in the scientific departments. This guide, in its second edition, includes a description of the academic program after updating the vocabulary and paragraphs of the previous guide in light of the latest developments in the educational system in Iraq, which included a description of the academic program in its traditional form (annual, quarterly), in addition to adopting the description of the academic program circulated according to the book of the Department of Studies 3/2906. On 5/3/2023 with regard to programs that adopt the Bologna Process as a basis for their work.

In this area, we can only emphasize the importance of writing descriptions of academic programs and courses to ensure the smooth conduct of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission, and goals, including an accurate description of the targeted learning outcomes according to the identified learning strategies.
Course Description: Provides a necessary summary of the most important course characteristics and learning outcomes that the student is expected to achieve, indicating whether they have made the most of the learning opportunities available. It is derived from the program description.
Program Vision: An ambitious picture for the future of the academic program to be a developed, inspiring, motivating, realistic and applicable program. **Program mission:** It briefly explains the objectives and activities necessary to achieve them, and also specifies the developmental paths and directions of the program.
Program objectives: These are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.
Curriculum structure: All courses/study subjects included in the academic program according to the approved learning system (Bologna track), whether it is a requirement (ministry, university, college, or scientific department), in addition to the number of courses and study units.
Learning Outcomes: A fixed set of knowledge, skills, and values that a student has acquired after successfully completing an academic program. The learning outcomes for each course must be defined in a way that achieves the program objectives.
Teaching and learning strategies: These are the strategies that a faculty member uses to develop the student's teaching and learning process, and they are the plans that are followed to reach learning goals. That is, it describes all curricular and extracurricular activities to achieve the learning outcomes of the program.

Academic program description form

University name: Northern Technical University
College/Institute: **Technical Engineering College for computer and AI** / Mosul

Scientific Department: Department of **Computer Techniques Engineering**

Name of the academic or professional program: Bachelor of Engineering techniques, **Computer**

Name of final degree: Bachelor of engineering techniques **Computer**

School system: Bologna
Description preparation date: 1/10/2024

Date of filling the file: *1/10/2024*

The signature:
Name of head of department:

Dr. Omar Ahmad Ibrahim

The date:

The signature:
Name of the scientific assistant:

Dr.Zakaria N. Mahmoud

The date:

The file was audited by the Quality Assurance and University Performance Division

Name of the Director of the Quality Assurance and University Performance Division: Nour Qahtan Younis

The date:

The signature:

Authentication of the Dean Dr.

Academic program description form

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The date:

Authentication of the Dean:

Dr. Omar Ibrahim Dallal Bashi

Date:

Signature:

The signature:
Name of the scientific assistant:

Dr.Zakaria N. Mahmoud

The date:

The file was audited by the Quality Assurance and University Performance Division

Name of the Director of the Quality Assurance and University Performance Division: Nour Qahtan Younis

1. Program Vision

The Department of Computer Engineering Technology aspires to be a distinguished and innovative department, serving as a cornerstone of knowledge and technological advancement. The department aims to enhance educational outcomes, foster an environment adaptable to modern developments, and keep pace with technological progress. It seeks to promote creativity, critical thinking, and problem-solving skills in technical and engineering fields among students and researchers. The department also aspires to contribute to scientific progress by developing and implementing advanced solutions in the fields of hardware and software.

. 2. Program message

The Computer Engineering Technology Department contributes to enhancing knowledge and skills in the field of computer engineering and information technology. By focusing on practical applications and problem-solving, it equips students with advanced concepts in these fields and prepares qualified and creative graduates capable of adapting to technological advancements. The program aims to have a positive impact on society by producing individuals capable of effectively contributing to various areas in this rapidly evolving scientific field.

3. Program Objectives

1. Developing Knowledge and Skills: Enhancing students' understanding and developing their skills in computer engineering and information technology across various specializations.

2. Focus on Practical Applications: Directing curricula and research towards practical applications and solving real-world problems in the field.

3. Providing Advanced Concepts: Offering education centered on advanced concepts in computer engineering and information technology.

4. Preparing Qualified Graduates: Developing educational programs to ensure students graduate with the skills and knowledge needed to enter the job market.

5. Fostering Creativity and Problem-Solving: Encouraging students to develop creativity and problem-solving skills, enabling them to address future technological challenges.

6. Enhancing Adaptability to Technological Advancement: Aiming to equip students to adapt to rapid technological advancements and motivating them to pursue lifelong learning and skill improvement.

7. Achieving a Positive Impact on Society: Striving to produce graduates capable of contributing effectively to various fields and creating a positive societal impact through technology.

4. Programmatic accreditation

Nothing

5. Other external influences

6. Program Structure

Program structure	Number of courses	Study unit	percentage	comments
Enterprise requirements	6	12	8	Basic course
College requirements	8	12	10	
Department requirements	55	120	82	
Summer training	2	2		
Other				

*Notes may include whether the course is core or elective.

7. Program description

Year/level	Course code	Name of the course	Name of the course	
Level 1 – First Semester	CTE100	Digital Logic	2	2
	TECCAI100	Mathematics	3	
	CTE102	Computer Organization	2	2
	CTE103	Engineering Drawing	1	2
	CTE101	Electrical Engineering Fundamentals	2	2
	NTU101	English Language	2	
	NTU100	Democracy and Human Rights	2	
Level 1 – second Semester	CTE104	Digital Circuits	2	2
	CTE105	Engineering Mathematics	3	
	TECCAI101	Computer Programming	2	2
	CTE107	Electronic Workshop		2
	CTE106	Electrical Circuits	2	2
	NTU103	Arabic Language	2	
	NTU 102	Computer Principles	1	2
Level 2 – First Semester	CTE200	Microprocessors	2	2
	CTE201	Analog Electronics Fundamentals	2	2
	CTE202	Object Oriented Programming	2	2
	CTE203	Applied Mathematics	3	
	CTE204	Data Structures	2	2
	CTE205	Measurements Sensors	1	1

	NTU200	Crimes of Defunct Ba'ath Party	2	
Level 2 – second Semester	CTE206	Computer Architecture	2	2
	CTE207	Electronic Circuits	2	2
	CTE209	Computer Application	1	2
	CTE208	Communication Fundamentals	2	2
	CTE210	Website Design	1	2
	CTE211	Summer Training1		5
	NTU203	Arabic Language	2	
Level 3 – First Semester (Computer Communication and Networking)	CTE300	Control Engineering	2	2
	CTE301	Microprocessor Supported Chips	2	2
	CTE302	Digital Signal Processing	2	2
	CTE303	Engineering Analysis	2	2
	CTE304	Digital Communication Fundamentals	2	2
	CTE305	Computer Networks Fundamentals	2	2
Level 3 – Second Semester (Computer Communication and Networking)	CTE306	Controllers	2	2
	CTE307	Operating Systems	2	2
	CTE308	Signals and Systems	2	2
	CTE309	Wireless Sensor Network And IoT	2	2
	CTE310	Digital Communication Systems	2	2
	CTE311	Computer Networks Systems	2	2
	CTE312	Summer Training2		5
Level 3 – First Semester (Computer Electronics)	CTE300	Control Engineering	2	2
	CTE301	Microprocessor Supported Chips	2	2
	CTE302	Digital Signal Processing	2	2
	CTE303	Engineering Analysis	2	2
	CTE304	Digital Communication Fundamentals	2	2
	CTE313	Microcontrollers	2	2
Level 3 – Second Semester (Computer Electronics)	CTE314	Computer Graphics	2	2
	CTE307	Operating Syatems	2	2
	CTE308	Signals and Systems	2	2
	CTE309	Wireless Sensor Network And IoT	2	2
	CTE310	Digital Communication Systems	2	2
	CTE315	Digital Controllers	2	2
	CTE312	Summer Training2		5
Level 4 – First Semester (Computer Communication and Networking)	CTE400	Information Theory and Coding	2	2
	CTE401	Security of Computers	2	2
	CTE402	Computer Protocols1	c	2
	CTE403	Intelligent Systems	2	2
	CTE404	Management	2	2
	CTE405	Project1		2
Level 4 –	CTE406	Wireless Communication	2	2
	CTE407	Advanced Digital Electronics	2	2

Second Semester (Computer Communication and Networking)	CTE408	Computer Protocols2	2	2
	CTE409	Cloud Computing	2	2
	CTE410	Multimedia Computing	2	2
	CTE411	Project2		2
Level 4 – First Semester (Computer Electronics)	CTE412	Hardware Description Language	2	2
	CTE413	Advanced Computer Technology	2	2
	CTE414	Computer Networks Fundamentals	2	2
	CTE403	Intelligent Systems	2	2
	CTE404	management	2	2
	CTE405	Project1		2
Level 4 – Second Semester (Computer Electronics)	CTE415	Embedded Systems	2	2
	CTE416	Electronic Devices	2	2
	CTE417	Computer Networks Systems	2	2
	CTE418	Advanced Computer Architecture	2	2
	CTE410	Multimedia Computing	2	2
	CTE411	Project2		2

8. Expected learning outcome of the program

knowledge

A –Cognitive Objectives	**Knowledge and Understanding** **A1. Preparing a staff of technical engineers with a high level of understanding, knowledge** **A2Continual development of academic programs through collaboration with corresponding departments to align with the requirements of local development** **A3. Equipping students with knowledge related to the development of large and medium-sized programming projects within specified timeframes and toward defined objectives.** **A4. Enabling graduates to evaluate alternative solutions to problems encountered in their work**

skills

B- Skill objectives	B. Subject-specific skills B1. 1. Conducting pure and applied scientific research to keep pace with scientific advancements. B2. Building bridges with the community through organizing scientific courses, seminars, and workshops to serve it.
value	
C- Emotional and value-based goals	A.1. Stimulate curiosity and interest: Motivate students to become curious about database concepts and how they are applied in different fields. A.2. Expand vision: Expand students' awareness of the importance of databases in their daily lives and in the fields of business and technology. A.3. Enhance self-confidence: Enhance students' self-confidence in dealing with data and using databases to solve problems. A.4. Stimulate creativity: Motivate students to develop creative solutions using databases in designing applications or technical solutions

9. Teaching and learning strategies

Blended Learning (Electronic and In-Person):

- Scientific films and videos.
- Laboratories.
- Summer and professional training.
- Graduation projects

10. **Assessment Methods:**

- Weekly, monthly, and daily exams.
- End-of-year examination.

11. **Faculty members:**

no	Name	General	Exact	Permanent/ contract
1	**Omar Ibrahim Ahmed**	Electronic and Communication	Electronic Engineering	permanent
2	**Emad A. Mohammed**	Electronic and communication engineering	Computer networks	Permanent
3	**Basma MohammedKamal Younis**	Computer engineering	Microprocessors Architecture	Permanent
4	**Khalis Assad Mhammed**	Electrical Engineering -	electronic and communication	Permanent
5	**Ahmed Waled Kasim**	Physics Sciences	Solid State Physics	Permanent
6	**Ahmad Khazal Younis**	Computer Engineering	Embedded system	Permanent
7	**Najwan Zuhair Waisi**	computer science		Permanent
8	**Maysaloon Abed Qasim**	Electrical Engineering -	electronic and communication	Permanent
9	**Eesha Ibrahim Mohammed**	Arabic language		Permanent
10	**Ziad Saeed Mohammed**	Electrical Engineering	/Electronic and Communications solid state	Permanent
11	**Hakam Marwan Zaidan**	Computer Engineering		Permanent
12	**Thabat Fakhri Younis**	Electrical Engineering-	Electronic	Permanent
13	**Azhar Waleed Talab**	**Computer Techniques Engineering**	/	Permanent
14	**Noor Sadalla Enad**	Communication Engineering		Permanent
15	**Rasha Bashar Mohammed**	Communication Engineering	/	Permanent
16	**Yasir Mosleh Abdal**	**Computer Techniques Engineering**	/	Permanent
17	**Omar Zeyad Tareq**	**Computer Engineering**	/	Permanent
18	**Ahmad Hashim Ahmad**	Electrical engineering	Power and machinery	Permanent
19	**Zaid abdulsattar abdulrazzaq**	Computer and information engineering	/	Permanent
20	**Lubab harith samy**	**Computer Techniques Engineering**	/	Permanent
21	**Zaid Ghanim Mahammed**	**Computer**	/	Permanent

		Techniques Engineering		
22	**Naqaa Luqman Mohammed**	**Computer Techniques Engineering**	/	Permanent
23	**Dhuha Abdulmunem Mohammed**	**Electrical Engineering**	/	Permanent
24	**Areej Mahmoud Asaad**	**Computer Techniques Engineering**	/	Permanent
25	**Ahmad falih Mahmood**	Computer engineering		Permanent

Professional development

Orienting new faculty members

1. Develop an orientation program to introduce new faculty members to the institution and its policies and procedures.

2.Pair new faculty with experienced mentors to provide guidance, support, and advice

3. Organize regular training workshops on teaching methodologies, assessment and research techniques

4. Establish a feedback mechanism for new faculty members to receive constructive feedback on their performance and areas of improvement

5. Encourage participation in conferences, seminars and research projects to promote professional growth

6 .Provide ongoing support through regular meetings, resources and access to professional development materials

Professional development for faculty members

1. Faculty skills should be assessed to study their educational and technical needs.

2 .Provide training courses to help develop faculty skills in areas such as advanced education, educational technologies, and rigorous assessment.

3. Encourage teamwork among faculty members to share experiences and knowledge.

4. Provide continuous updates on the latest in the fields of education and educational technologies.

5. Provide continuous support to faculty members to help solve the problems and challenges they face.

6. Conduct periodic evaluations to review the professional development of faculty members and

identify advantages and disadvantages

12. Acceptance criterion

- Scientific section .
- Professional study.

13. The most important sources of information about the program

1. University website.
2. The location of the department.
3. Academic description files and program specifications.
4. Academic Program Review Form.
5. Research sites in the college.

14. Curriculum Improvement:

- Updating **Laboratory Software.**
- Utilizing **Modern Resources.**

Curriculum Skills Map																			
Please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed																			
Programme Learning Outcomes																			
Year/level	**Course Code**	**Course Title**	**Core (C) Title or Option (O)**	**Knowledge and understanding**				**Subject-specific skills**				**Thinking Skills**				**General and Transferable Skills relevant to employability and personal development**			
				A1	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**C1**	**C2**	**C3**	**C4**	**D1**	**D2**	**D3**	**D4**
First	CTE100	**Digital logic**	**Fundamental**	B		T	T			B	L	T	P		L	L			P
	NTU100	Human rights and Democracy	**Accessory**	T			T			P			R		R		T		R
Second	CTE206	**Computer architecture**	**Fundamental**	T	L	B	L				T		P				P		R
	CTE207	Electronic Circuits	**Accessory**	T	B	P									T		L		B
Third	CTE302	**Digital Signal Processing**	**Fundamental**	T	B		S				R		L					T	
	CTE303	**Engineering analysis**	**Accessory**	T	P		B				P				T			P	J
Forth	CTE408	**Computer protocols**	**Fundamental**	T	L		B				L							T	J
	CTE404	**management**	**Accessory**	T	L	B													

B/ Book T/ Theory P/Practical R/Report S/Seminar L/Lab. J/Project

Ministry of Higher Education and
Scientific Research - Iraq
Northern Technical University
Engineering Technical College/Mosul
Department of Computer Techniques Engineering

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	CTE100				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level	1		**Semester of Delivery**	1	
Administering Department	**Department of Computer Techniques Engineering**		**College**	**Northern Technical University Engineering Technical College for Computer and Artificial Intelligence /Mosul**	
Module Leader	Khalis A. Mohammed		**e-mail**	Khalis_am@ntu.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	M.Sc.	
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name	None		**e-mail**	None	
Review Committee Approval	21/09/2024		**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 Objectives أهداف المادة الدراسية	1. To learn the basic techniques and methodologies for designing and analyzing digital systems and how to apply these techniques to build specific circuits. 2. Define the problem (Inputs and Outputs), write its functions 3. Implement functions using Combinational digital circuit. 4. Minimize functions using any type of minimizing algorithms (Boolean algebra, Karnaugh-Map or Tabulation Method). 5. Have knowledge in analyzing and designing procedures of Combinational digital circuits.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Learning about the different number systems. 2. Learning the arithmetic operations related to different number systems. 3. Learning the different logic gates of computer system and their work. 4. Ability to design, simplify and implement different logical and arithmetic circuits that considered the basic of digital system. 5. Ability to design, simplify and implement different sequential circuits, counters and shift registers.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Part 1 – Numbers Systems, Operations, and Codes Different Number Systems, Data representation (integer and fraction) using different number systems. Conversion Between Different Numbers Systems. Arithmetic operations using different number systems, and Digital Codes (BCD, Parity, Gray, Excess-3 ….. etc.) [14 hrs] • Part 2- Logic Gates The Inverter (NOT Gate), AND Gate, OR Gate, NAND Gate, NOR Gate, the Exclusive-OR Gate and Exclusive-NOR Gates. [12 hrs] • Part 3 Boolean Algebra and Logic Simplification Boolean Operations and Expressions, Laws and Rules of Boolean Algebra, Simplification Using Boolean Algebra, DE Morgan's theorems, The Karnaugh Map (1, 2 , 3 and 4 variables) , SOP and POS Minimization. [16 hrs] • Part 4 Combinational Logic Analysis Basic Combinational Logic Circuits, Implementing Combinational Logic, Combinational Logic Using NAND and NOR Gates, Logic Circuit Operation with Pulse Waveform Inputs. [10 hrs] • Revision problem classes [6 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

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

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.93
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	101	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.73
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	8	10% (10)	4,6,10,12	LO #1, 2, 10 and 11
	Assignments	8	10% (10)	2, 5,8,11	LO # 3, 4, 6 and 7
	Projects / Lab.	15	10% (10)	Continuous	All
	Report	8	10% (10)	1,3,9,13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	**1- Numbers Systems, Operations, and Codes:** Decimal Numbers, Binary numbers.
Week 2	**1- Numbers Systems, Operations, and Codes**: Hexadecimal Numbers, Octal numbers.
Week 3	**1- Numbers Systems, Operations, and Codes**: Data representation (integer and fraction) using different number systems. Conversion Between Different Numbers Systems .
Week 4	**1- Numbers Systems, Operations, and Codes**: Arithmetic operations using 9's and 10's Complements of Decimal Numbers. Arithmetic operations using 1's and 2's Complements of Binary Numbers.
Week 5	**1- Numbers Systems, Operations, and Codes:** Signed Numbers, Arithmetic Operations with Signed Numbers.
Week 6	**1- Numbers Systems, Operations, and Codes:** Digital Codes (BCD, Excess-3, Parity, Gray ….. etc.).
Week 7	**2- Logic Gates:** The Inverter (NOT Gate), The AND Gate, The OR Gate.
Week 8	**2- Logic Gates:** NAND Gate, NOR Gate, Exclusive-OR Gate and Exclusive-NOR Gates.
Week 9	**3- Boolean Algebra and Logic Simplification**: Boolean Operations and Expressions.
Week10	**3- Boolean Algebra and Logic Simplification:** Laws and Rules of Boolean Algebra.
Week11	**3- Boolean Algebra and Logic Simplification** Simplification Using Boolean Algebra. DeMorgan's theorems.
Week12	**3- Boolean Algebra and Logic Simplification** The Karnaugh Map (1, 2 , 3 and 4 variables) , SOP and POS Minimization.
Week13	**4- Combinational Logic Analysis:** Basic Combinational Logic Circuits. Implementing Combinational Logic.
Week14	**4- Combinational Logic Analysis:** Combinational Logic Using NAND and NOR Gates. Logic Circuit Operation with Pulse Waveform Inputs.
Week15	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to digital laboratory kit operation
Week 2	Lab 2: Logic Gates (AND, OR, NOT, NAND, NOR).
Week 3	Lab 3: Logic Gates (XOR, XNOR).
Week 4	Lab 4: Design of (AND, OR, NOT) gates Using NAND gates.
Week 5	Lab 5: Design of (AND, OR, NOT) gates Using NOR gates.
Week 6	Lab 6: Implementation of logic circuits using NANAD-gate only.
Week 7	Lab 7: Implementation of logic circuits using NOR-gate only.
Week 8	Lab 8: Implementation of DeMorgan theory, 1st Law

Week 9	Lab 9: Implementation of DeMorgan theory, 2nd Law
Week 10	Lab 10: Design of a combinational logic circuits . Part 1
Week 11	Lab 11: Design of a combinational logic circuits. Part 2
Week 12	Lab 12: Realization of Boolean equation. Part 1
Week 13	Lab 13: Realization of Boolean equation. Part 2
Week 14	Lab 14: Review

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Thomas L. Floyd, Digital Fundamentals, 11th Edition, Pearson Education 2015	Yes
Recommended Texts	M. Morris Mano, Michael D. Ciletti, Digital Design, 5th edition, Pearson Education 2013	No
Websites	Digital Systems: From Logic Gates to Processors: https://www.coursera.org/learn/digital-systems	

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.

Ministry of Higher Education and
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Engineering Technical College/Mosul
Department of Computer Techniques Engineering

Module Descriptor Form

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Mathematics	**Module Delivery**	
Module Type	Basic	✓ **Theory** ✓ **Lecture** **Lab** ✓ **Tutorial** **Practical** ✓ **Seminar**	
Module Code	TECCAI100		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	**Semester of Delivery**	1
Administering Department	**Department of Computer Techniques Engineering**	**College**	**Northern Technical University Engineering Technical College of Computer and Artificial Intelligence/Mosul**
Module Leader	Ayhan A. khaleel	**e-mail**	Ay_ahmed@ntu.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	21/09/2024	**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 Objectives أهداف المادة الدراسية	Mathematics is an important tool for understanding modern and scientific technologies, and the modern world today relies heavily on mathematics. Mathematics is also characterized by multiple benefits, including that it is an intellectual tool, a strong communication method, and it is in itself a way of thinking, through which the capabilities of individuals develop, and it helps us in advanced logical thinking. It also helps the student to understand the laws and issues needed for the purpose of solving simple and complex electrical circuits.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	6. Learning about the basic Matrix and Determinants 7. Learning the Algebraic functions, natural logarithm, the exponential function, trigonometric functions, inverse trigonometric functions and hyperbolic functions. 8. Learning the Derivatives formula and chain rule. 9. Learning the Integration, Indefinite and Definite Integral 10. Learning the Integration method
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: **Part A –** the basic Matrix and Determinants Matrix, properties, and operations, Determinants and properties of determinants Inverse of square matrix by determinants, Solving linear System equations using the inverse of the coefficient matrix and Cramer's rule. [13 hrs] **Part B –** Algebraic functions Review of natural logarithm, the exponential function, trigonometric functions, inverse trigonometric functions and hyperbolic functions. [10 hrs] **Part C –** Derivatives of natural logarithm, the exponential function, trigonometric functions, inverse trigonometric functions and hyperbolic functions. Applications of differentiation. [20 hrs] **Part D:** Review of Integration, Indefinite and Definite Integral, Integration method and Applications of integration, approximation(trapezoidal rule, Simpson's rule) Area between curves [10 hrs] Revision problem classes [6 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in the delivery of this unit is to encourage students to participate in exercises, while improving and expanding their mathematical reasoning skills.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	59	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	66	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	8	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	13	10% (10)	Continuous	All
	Projects / Lab.	0	0		
	Report	0	0		
Summative assessment	**Midterm Exam**	2 hr	20% (20)	7	LO # 1-7
	Final Exam	3 hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Matrix, properties, and operations
Week 2	Determinants and properties of determinants Inverse of square matrix by determinants
Week 3	Solving linear System equations using the inverse of the coefficient matrix and Cramer's rule
Week 4	Algebraic functions
Week 5	Review of natural logarithm, the exponential function, trigonometric functions
Week 6	inverse trigonometric functions and hyperbolic functions
Week 7	Derivatives formula and chain rule.
Week 8	Derivatives of natural logarithm, the exponential function, trigonometric functions
Week 9	inverse trigonometric functions and hyperbolic functions.
Week 10	Applications of differentiation.
Week 11	Review of Integration, Indefinite and Definite Integral
Week 12	Integration method
Week 13	Integration method
Week 14	Applications of integration, approximation(trapezoidal rule, Simpson's rule) Area between curves
Week 15	Final Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	**Advance Engineering Mathematics, Alan Jeffrey, 2002**	Yes
Recommended Texts	**Calculus I, Paul Dawkins, 2007**	No
Websites	https://tutorial.math.lamar.edu/Classes/CalcII/CalcII.aspx	

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.

Ministry of Higher Education and Scientific Research - Iraq
Northern Technical University
Engineering Technical College/Mosul
Department of Computer Technology Engineering

Module Descriptor 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	CTE102		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	1	**Semester of Delivery**	1
Administering Department	**Department of Computer Technology Engineering**	**College**	**Northern Technical University Engineering Technical College of Computer and Artificial Intelligence/Mosul**
Module Leader	Mohammed G. Ayoub	**e-mail**	Mohammed.ghanim@ntu.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	14/09/2024	**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 Objectives أهداف المادة الدراسية	**At the end of this course, following learning objectives are expected to be achieved:** -To understand principles of computer organization and the basic architectural concepts. -To understand the structure, function and characteristics of computer systems. -To understand how the various components of Computer Systems fit together and interact. -To explain the function of each element of a memory hierarchy.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Understand the basic concepts and structure of computers. • Understand the main architectures of computer systems. • Learn the concept of memory hierarchy. • Understand the architecture and functionality of memory and storage in the computer systems. • Understand the theory and architecture of central processing unit.

	• Understand the architecture and functionality of I/O units. • To be familiar with fundamental programming concepts and methodology. • Understand the theory and architecture of Intel Microprocessors.
Indicative Contents المحتويات الإرشادية	1. **Introduction to Computer Systems:** [2 hr.] a. Overview of Computer Characteristics b. Introduction to Software and Hardware c. Comparison of different Computers Categories 2. **Introduction to Computer Architecture:** [2 hr.] a. Von Neumann and Harvard architectures b. Advantages and disadvantages of both architectures 3. **The Memory Hierarchy:** [4 hr.] a. Overview of memory hierarchy in computer systems b. Comparison of different memory types such as Registers, Caches, Main Memory c. Calculation of Average Memory Access Time d. Overview of Cache Miss and Cache Hit 4. **Types of CPU Register and their Functions:** [2 hr.] a. Operations of CPU Registers b. Types and Functions of CPU Registers 5. **Computer Bus | Types and Functions:** [2 hr.] a. Data Bus, Address Bus, Control Bus b. Internal and External Buses 6. **Semiconductor Memory Types & Technologies:** [6 hr.] a. Memory Array, Capacity and Addressing b. Read and Write Operations in Memory c. SRAM, DRAM, RAM Family, ROM Family d. Flash Memory, Magnetic Storage, e. Optical Storage and Cloud Storage System 7. **Basic Operation of Processors:** [2 hr.] a. Fetch/Execute Cycle b. Pipelining and Processor Elements 8. **Levels of Programming Languages:** [2 hr.] a. Assembly Language and Machine Language 9. **Introduction to the Intel Microprocessors:** [6 hr.] a. Pre-Pentium Intel Process b. 4004,8080/8085,8086/8086 80386,80486 and Multicore

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

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

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	58	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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	8% (8)	3, 6, 9, 12	LO #1-2, 3-5, 6-8 and 10-11
	Assignments	4	8% (8)	2, 5, 11, 14	LO # 1, 3, 7-9 and 12-13
	Lab.	4	8% (8)	Continuous	All
	Report	5	10% (10)	Continuous	All
	Seminar	1	6% (6)	10	LO 1-8
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	Introduction to Computer Systems
Week 2	Introduction to Computer Architecture
Week 3	The Memory Hierarchy
Week 4	Average Memory Access Time (AMAT)
Week 5	Types of CPU Register and their Functions
Week 6	Computer Bus | Types and Functions
Week 7	Basics of Semiconductor Memory | Types & Technologies Parts I
Week 8	Basics of Semiconductor Memory | Types & Technologies Parts II
Week 9	Basics of Semiconductor Memory | Types & Technologies Parts III
Week 10	Basic Operation of Processors
Week 11	Levels of Programming Languages
Week 12	Introduction to the Intel Microprocessors Parts I
Week 13	Introduction to the Intel Microprocessors Parts II
Week 14	Introduction to the Intel Microprocessors Parts III
Week 15	Final Exam

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Computer System Parts
Week 2	Lab 2: Peripherals Devices
Week 3	Lab 3: Computer Monitors
Week 4	Lab 4: Computer Cables
Week 5	Lab 5: Types of Microprocessors
Week 6	Lab 6: Types of Memory in Computer System
Week 7	Lab 7: Storage in Computer System
Week 8	Lab 8: Motherboards and Graphics Card

Week 9	Lab 9: Types of Computer Ports
Week 10	Lab 10: Computer Software Part I
Week 11	Lab 11: Computer Software Part II
Week 12	Lab 12: Programming Languages
Week 13	Lab 13: Computer Networks
Week 14	Lab 14: Review

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Recommended Texts	1. 1- Computer Architecture & Organisation by Atul. P. Godse, Deepali. A. Godse. Publisher: Technical Publication 2019. **2.** 2- Computer Systems Architecture by Yadin, Aharon. Publisher: Taylor & Francis Group, Year: 2016.	No
Websites	https://www.coursera.org, https//www.udemy.com	

APPENDIX:

GRADING SCHEME
مخطط الدرجات

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

Note:

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
Northern Technical University
Engineering Technical College/Mosul
Department of Computer Technology Engineering

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	Engineering Drawing	**Module Delivery**	
Module Type	Core		✓ **Theory** ✓ **Lecture** ✓ **Lab** ✓ **Tutorial** ✓ **Practical** ✓ **Seminar**
Module Code	CTE103		
ECTS Credits	3		
SWL (hr/sem)	75		

Module Level	1	**Semester of Delivery**	1
Administering Department	Department of Computer Techniques Engineering	**College**	**Northern Technical University Engineering Technical College of Computer and Artificial Intelligence/Mosul**
Module Leader	Naqaa L. Mohammed	**e-mail**	
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc.
Module Tutor	None	**e-mail**	Naqaa_alhamo@ntu.edu.iq
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	12/09/2024	**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. Define engineering drawing material, its uses and Engineering drawing tools 2. Introduction to Engineering drawing through AutoCAD software 3. Developing the student's mental and abilities in drawing simple and complex

	shapes 4. Decomposes 3D shapes into binary projections
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	11. Learning types of engineering lines and their uses and how to draw 12. Drawing geometric shapes such as square, rectangular, parallelogram and circle 13. Learning dimensions in engineering drawing and how to put them on the drawing 14. Learning Fundamentals of projection in engineering drawing 15. Ability of drawing an anthropomorphic shape
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Part A – AutoCAD interface Setup, save, limits, grid, object snap and ortho mode [3 hrs.] • Part B- Coordinate method Direct distance method, Absolute coordinate, Relative coordinate, Polar coordinate[3hrs] • Part C Draw menu Line, polyline, rectangle, arc, circle, ellipse and hatch [12hrs] • Part D Modify and Properties menu Copy, move, offset, erase, extend, trim and array, line shape and line size [9 hrs.] • Part D Projection Front, side and top ortho projections [6 hrs.] • Part E stereoscopic shapes Method for drawing stereoscopic shapes[6hrs] • Revision problem classes [8 hrs.]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

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

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	45	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	30	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
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**	3	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	3	5% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	5% (10)	Continuous	All
	Report	0	0% (0)	0	0
Summative assessment	**Midterm Exam**	2 hr	30% (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	-Get a quick introduction to AutoCAD -Drawing Setup in AutoCAD -Use precision drawing tools such as Grid, Object Snap, and Limits to create accurate measurements in drawings.
Week 2	Coordinate method (Direct distance method, Absolute coordinate, Relative coordinate, Polar coordinate)
Week 3	Draw menu (line, poly line, polygon, rectangle).
Week 4	Drawing objects of Pentagonal, hexagonal and octagonal shapes
Week 5	Draw menu (arc, circle, ellipse, point and text).
Week 6	Draw several shapes containing circles and texts
Week 7	Modify menu (erase, copy, mirror, move offset,)
Week 8	Modify menu (rotate, trim, extend, explode)
Week 9	Properties and Layers in AutoCAD and dimension
Week 10	Orthographic projection
Week 11	Draw the three projection(front, side and top) of some shapes
Week 12	Basics of drawing stereoscopic shapes
Week 13	Draw stereoscopic shape
Week 14	Printing the graphic
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Definition of AutoCAD interface
Week 2	**Lab 2**: Applications of Coordinate method
Week 3	Lab 3: Draw figures of lines, polygons and rectangle
Week 4	Lab 4: Drawing objects of Pentagonal, hexagonal and octagonal shapes
Week 5	Lab 5:Drawing figures of circles and ellipse
Week 6	Lab 6: Draw several shapes containing circles and texts
Week 7	Lab 7: Applications of some order in modify menu

Week 8	Lab 8: Applications of other order in modify menu
Week 9	Lab 9: Practicing of using layers
Week 10	Lab 10:Practicing of projection of simple figure
Week 11	Lab 11: Draw three projection of figure
Week 12	Lab 12: Practicing of drawing stereoscopic shapes
Week 13	Lab 13: Draw stereoscopic shape
Week 14	Lab 14: Practicing of Printing the graphic

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	AutoCAD 2017 2D Fundamentals Randy H. Shih ® Tutorial First Level by Randy H. Shih	No
Recommended Texts	Introduction to AutoCAD 2011 2D and 3D Design, Alf Yarwood	No
Websites	https://youtu.be/XFO8VQT731M **Introduction to AutoCad 2017 Tutorial series**	

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.

Ministry of Higher Education and
Scientific Research - Iraq
Northern Technical University
Engineering Technical College/Mosul
Department of Computer Techniques Engineering

Module Descriptor Form

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	**fundamentals of electrical engineering**	**Module Delivery**	
Module Type	Core	✓ **Theory** ✓ **Lecture** ✓ **Lab** ✓ **Tutorial** ✓ **Practical** ✓ **Seminar**	
Module Code	CTE101		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	1	**Semester of Delivery**	1
Administering Department	**Department of Computer Techniques Engineering**	**College**	**Northern Technical University Engineering Technical College of Computer and Artificial Intelligence/Mosul**
Module Leader	Maysaloon Abed Qasim	**e-mail**	Maysloon.alhashim@ntu.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	PhD
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	21/09/2024	**Version Number**	1.0

Relation With Other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	This course focuses on direct current (DC) circuit analysis and aims to: 1-Understanding of the fundamental laws and elements of electrical circuits design and application. 2-Understand the techniques to analyze different circuit configuration 3- Analyze resistive circuits and laws/theorems including Kirchhoff's Superposition, Thevenin's, Nortons, and Maximum Power Transfer.

	4- Develop students computational skills.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Having successfully completed the course, students will be able to: 1- Know the various types of electric circuits. 2-Know the Elements of electric circuits and their roles 3-Apply different techniques to analyze electric circuits. 4-Solve Problem of different electric circuits 5-Compare the application of different type of electric circuits. 6-Appreciate the importance of electric circuit elements. 7-Compare and contrast the operation of different types of electrical elements. 8-Derive equations related to the circuit's performance and design. 9-Identify different types of electrical elements and their applications.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Part A – General Electric System. Constituent parts of an electrical system (source, load, communication & control), Current flow in a circuit, Electromotive force and potential difference, Electrical units. Ohm's law, Resistors, Resistivity, Temperature rise & Temperature coefficient of resistance, Voltage & Current sources [8 hrs] • Part B DC circuits. Series circuits, Parallel circuits. Kirchhoff's laws. Power and energy [14 hrs] • Part C Network Theorems . Star-delta & delta-star transformation. Sources transformations Mesh analysis. Nodal analysis. Superposition theorem. Thevnin's theorem. Norton's theorem. Maximum power transfer theorem. [32 hrs] • Revision problem classes [4 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	1-**Hands-on Experiments:** Engage students in practical experiments to deepen their understanding of circuits. 2-**Simulation Software:** Use circuit simulation software for virtual circuit design and analysis. 3-**Problem-solving Exercises:** Include various problem-solving exercises to apply circuit analysis techniques. 4-**Group Projects:** Assign collaborative projects for circuit design and construction. 5-**Real-world Applications:** Discuss practical applications of circuits in different devices and systems. 5-**Interactive Discussions:** Encourage student participation and critical thinking through open-ended questions. 6-**Conceptual Understanding:** Focus on intuitive understanding alongside mathematical analysis. 7-**Assessment Variety:** Use diverse assessment methods to gauge student understanding. 8-**Office Hours and Support:** Offer individualized assistance through office hours or online support.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	58	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	117	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	8	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	8	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	15	10% (10)	Continuous	All
	Report	8	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	Constituent parts of an electrical system, Current flow in a circuit, Electromotive force and potential difference, Electrical units.
Week 2	Ohm's law, Resistors, Resistivity, Temperature rise & Temperature coefficient of resistance, Voltage & Current sources
Week 3	Series circuits , Parallel circuits.
Week 4	Kirchhoff's laws.
Week 5	Power and energy.
Week 6	Star-delta & delta-star transformation
Week 7	Sources transformations
Week 8	Mesh analysis.
Week 9	Nodal analysis.
Week 10	Superposition theorem.
Week 11	Thevnin's theorem
Week 12	Nortan's theorem
Week 13	Maximum power transfer theorem.
Week 14	Reciprocity theorem
Week 15	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Connection of resistances in series and parallel.
Week 2	Lab 2: Verification of Ohm's law using hardware .
Week 3	Lab 3: Verification of Ohm's law using digital simulation.
Week 4	Lab 4: Verification of Kirchhoff's current law and Voltage law using hardware.
Week 5	Lab 5: Verification of Kirchhoff's current law and Voltage law using digital simulation.
Week 6	Lab 6: Determination of mesh currents using hardware.
Week 7	Lab 7: Determination of mesh currents using digital simulation.
Week 8	Lab 8: Measurement of nodal voltages using hardware and digital simulation.
Week 9	Lab 9: Verification of superposition theorem using hardware .
Week 10	Lab 10: Verification of superposition theorem using digital simulation.
Week 11	Lab 11: Verification of Thevnin's theorem using hardware.
Week 12	Lab 12: Verification of Thevnin's theorem using hardware.
Week 13	Lab 13: Verification of Nortan's using hardware.
Week 14	Lab 14: Verification of Nortan's using digital simulation.

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Charles K. Alexander, Matthew N.O. Sdiku Fundamentals of Electrical Engineering, 4th Edition, 2009	Yes
Recommended Texts	Tony R. Kuphaldt, Lessons In Electric Circuits, Volume I - DC 5th edition, Pearson Education 2002	No
Websites	Direct Current (DC) https://www.allaboutcircuits.com/textbook/direct-current/	

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.

Ministry of Higher Education and
Scientific Research - Iraq
Northern Technical University
Engineering Technical College/Mosul
Department of Computer Techniques Engineering

Module Descriptor Form

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	**Human rights and Democracy**	**Module Delivery**	
Module Type	Suplement	✓ **Theory** ✓ **Lecture** **Lab** **Tutorial** **Practical** ✓ **Seminar**	
Module Code	NTU100		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	**Semester of Delivery**	1
Administering Department	**Department of Computer Techniques Engineering**	**College**	**Northern Technical University Engineering Technical College of Computer and Artificial Intelligence/Mosul**
Module Leader	**Dr. Eesha I. Mohammed**	**e-mail**	aysha.ibrahim@ntu.edu.iq
Module Leader's Acad. Title	Assist Prof.	**Module Leader's Qualification**	PHD
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	21/09/2024	**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 Objectives أهداف المادة الدراسية	تهدف الديمقراطية وحقوق الانسان للحفاظ على كرامة الفرد وحقوقه الأساسية وتعزيزها كما تحقيق العدالة الاجتماعية وتشجيع التنمية الاقتصادية والاجتماعية للمجتمع وتماسكه فضلا عن توطيد الأمان الوطني وإرساء مناخ مؤات للسلام الدولي وذلك لان حقوق الانسان والديمقراطية مرجعاً أساسياً للجميع لحماية حقوق الإنسان؛ وهي توفر بيئة لحماية حقوق الإنسان وإعمالها إعمالاً فعلياً. واليوم، بعد مضي فترة على تحقيق الديمقراطية في مختلف أنحاء العالم، يبدو أن العديد من النظم الديمقراطية تتراجع. ويظهر أن بعض الحكومات تتعمد إضعاف إجراء عمليات تحقق مستقلة بشأن سلطاتها، والقضاء على أي نقد، وتفكيك الرقابة الديمقراطية وضمان حكمها لمدة طويلة، مع أثر سلبي على حقوق الشعب.
Module Learning	**1** - فهم ومعرفة وأدراك حقوقه التي اقرها الله له وللبشر جميعاً وبالتالي فهي هبه وليس مكسب من أحد ولا يحق لأي شخص

Outcomes مخرجات التعلم للمادة الدراسية	انتزاعها. **2-** يعبر الطالب بأسلوبه الخاص عن هذه الحقوق ويدافع عنها. **3-** تعليل الظواهر واعطاء التفسيرات لما يحدث امامه من انتهاك لحقوق الانسان وحرياته من خلال تحديد اوجه النقص او الثغرات الموجودة في ضوء المعلومات المتوفرة لديه **4-** فهم اهم النظم السياسية والتي تعد ضمانه لحقوق الانسان وحرياته السياسية ومحاولة تطبيقه على ارض الواقع الا وهو النظام الديمقراطي.
Indicative Contents المحتويات الإرشادية	❖ حقوق الانسان في التاريخ المعاصر والحديث: الاعتراف الدولي بحقوق الانسان منذ الحرب العالمية الأولى وعصبة الامم المتحدة (4 ساعات) ❖ حقوق الانسان، تعريفها، اهدافها وحقوق الانسان في الحضارات القديمة وخصوصا حضارة وادي الرافدين (6 ساعات) ضمانات واحترام وحماية حقوق الانسان على الصعيد الدولي: - دور الأمم المتحدة ووكالاتها المتخصصة في توفير الضمانات - دور المنظمات الاقليمية (الجامعة العربية، الاتحاد الأوربي، الاتحاد الافريقي، منظمة الدول الأمريكية، منظمة آسيان) ❖ دور المنظمات الدولية الاقليمية غير الحكومية والرأي العام في احترام وحماية حقوق الانسان (12 ساعة) ❖ المشاكل والمعوقات ونقاشات الطلبة (6 ساعات)

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	-استراتيجية التفكير حسب قدرة الطالب 2-استراتيجية مهارة التفكير العالية 3-استراتيجية التفكير الناقد في التعلم 4-العصف الذهني

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	28	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	22	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.5
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**	4	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	0	0	Continuous	All
	Projects / Lab.	0	0		
	Report	4	10% (10)		
Summative assessment	**Midterm Exam**	2 hr	20% (20)	7	LO # 1-7
	Final Exam	3 hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	حقوق الانسان، تعريفها، اهدافها حقوق الانسان في الحضارات القديمة وخصوصا حضارة وادي الرافدين
Week 2	حقوق الانسان في الشرائع السماوية مع التركيز على حقوق الانسان في الإسلام
Week 3	حقوق الانسان في التاريخ المعاصر والحديث : الاعتراف الدولي بحقوق الانسان منذ الحرب العالمية الأولى وعصبة الامم المتحدة
Week 4	الاعتراف الاقليمي بحقوق الانسان : الاتفاقية الاوربية لحقوق الانسان 1950 ، الاتفاقية الامريكية لحقوق الانسان 1969 ، الميثاق الافريقي لحقوق الانسان 1981 ، الميثاق العربي لحقوق الانسان 1994
Week 5	حقوق الانسان في التاريخ المعاصر والحديث : الاعتراف الدولي بحقوق الانسان منذ الحرب العالمية الأولى وعصبة الامم المتحدة
Week 6	حقوق الانسان في الدساتير العراقية بين النظرية والواقع
Week 7	حقوق الانسان الاقتصادية والاجتماعية والثقافية و حقوق الانسان المدنية والسياسية
Week 8	حقوق الانسان الحديثة : الحقائق في التنمية ، الحق في البيئة النظيفة ، الحق في التضامن ، الحق في الدين
Week 9	ضمانات احترام وحماية حقوق الانسان على الصعيد الوطني ، الضمانات في الدستور والقوانين الضمانات في الرقابة الدستورية ، الضمانات في حرية الصحافة والرأي العام ، دور المنظمات غير الحكومية في احترام وحماية حقوق الانسان
Week 10	ضمانات واحترام وحماية حقوق الانسان على الصعيد الدولي : - دور الأمم المتحدة ووكالاتها المتخصصة في توفير الضمانات - دور المنظمات الاقليمية (الجامعة العربية ، الاتحاد الأوربي ، الاتحاد الافريقي ، منظمة الدول الأمريكية ، منظمة آسيان) دور المنظمات الدولية الاقليمية غير الحكومية والرأي العام في احترام وحماية حقوق الانسان
Week 11	مصطلح الديمقراطية ، نشأته، دلالته، تاريخ الديمقراطية.
Week 12	الاسلام والديمقراطية ومساوئ الحكم الاستبدادي .
Week 13	الانتقادات الموجهة للديمقراطية، ومحاسن النظام الديمقراطي.
Week 14	الأنظمة الديمقراطية في العالم/الديمقراطية في العالم الثالث/ المشاكل التي تواجه البلدان العربية في التحول الديمقراطي
Week 15	**الامتحان النهائي**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	حقوق الانسان والديمقراطية – المفاهيم والمرتكزات للدكتور سماح مهدي العلياوي والدكتور سلمان كاظم البهادلي	Yes
Recommended Texts	الديمقراطية وحقوق الانسان في الاسلام للدكتور راشد الغنوشي	No
Websites	https://www.neelwafurat.com https://studies.aljazeera.ne	

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.

Ministry of Higher Education and
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Department of Computer Techniques Engineering

Module Descriptor Form
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	English Language	**Module Delivery**	
Module Type	SUPPLEMENT	✓ **Theory** ✓ **Lecture** **Lab** **Tutorial** **Practical** ✓ **Seminar**	
Module Code	NTU101		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	**Semester of Delivery**	2
Administering Department	**Department of Computer Techniques Engineering**	**College**	**Northern Technical University Engineering Technical College of Computer and Artificial Intelligence/Mosul**
Module Leader	dr. Younis Anas Younis	**e-mail**	younis.alrozz@ntu.edu.iq
Module Leader's Acad. Title	**Lecturer**	**Module Leader's Qualification**	**PhD.**
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	21/09/2024	**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	To enable the learner to communicate effectively and appropriately in real life situation. To use English effectively for study purposes across the curriculum. To develop and integrate the use of the four language skills i.e. Reading, Listening, Speaking, and Writing. To revise and reinforce structure already learned.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Students will heighten their awareness of the correct usage of English grammar in writing and speaking. Students will improve their speaking ability in English both in terms of fluency and comprehensibility. Students will give oral presentations and receive feedback on their performance. Students will increase their reading speed and comprehension of academic articles. Students will improve their reading fluency skills through extensive reading. Students will enlarge their vocabulary by keeping a vocabulary journal.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: Part 1 – **Grammar** [4 hrs] Tenses, Present tenses: Present Simple, Present Continuous Part 2 – **Vocabulary** [6 hrs] Irregular verbs, making connections, Nouns, verbs, and adjectives, Making negatives. Part 3 – **Speaking** [6 hrs] Information gap, people's lifestyles, comparing cities. Part 4 – **Listening**[4 hrs] Telling stories, Town survey, attitudes to shopping, comparing cities. **Revision [2 hrs]**

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage student's participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials, and interesting sampling activities for the students.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	22	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	28	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.12
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**	4	10% (10)	3, 7, 11, 14	LO #1, 2, 10 and 11
	Assignments	0	0	0	0
	Projects / Lab.	0	0	0	0
	Report	4	10% (10)	5, 6, 8, 10, 13	LO # 5, 8 and 12
Summative assessment	**Midterm Exam**	2 hr	20% (20)	7	LO # 1-7
	Final Exam	3 hr	60% (60)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Grammar: Tenses, Questions, Questions words Vocabulary: Using a bilingual dictionary, Parts of speech, and Words with more than one meaning.

	Everyday English: Social expressions.
Week 2	Reading: the many ways we communicate Speaking: Information gap Listening: Neighbors
Week 3	Grammar: Present tenses: Present Simple, Present Continuous, have/have got Vocabulary: Describing countries, Collocation Everyday English: Making conversation
Week 4	Reading: three people talk about their experiences Speaking: people's lifestyles Listening: what annoys you about the people in your life?
Week 5	Grammar: Past tenses: Past Simple, Past Continuous Vocabulary: Irregular verbs, making connections, Nouns, verbs, and adjectives, Making negatives. Everyday English: Time expressions
Week 6	Reading: Newspaper stories Speaking: Telling stories Listening: A radio drama
Week 7	Grammar: Quantity, Articles Vocabulary: Buying things Everyday English: Prices and shopping
Week 8	Reading: 'The best shopping street in the world' Speaking: Town survey, attitudes to shopping Listening: Buying things
Week 9	Grammar: Verb patterns 1, Future intentions Vocabulary: Hot verbs Everyday English: How do you feel?
Week 10	Reading: Hollywood kids Speaking: Being a teenager Listening: You've got a friend
Week 11	Grammar: Comparative and superlative adjectives Vocabulary: Synonyms and antonyms Everyday English: Directions
Week 12	Reading: 'A Tale of two millionaires' Speaking: comparing cities Listening: Living in another country
Week 13	Grammar: Present Perfect and Past Simple Vocabulary: Past participles, Adverbs, Word pairs Everyday English: Short answers
Week 14	Review
Week 15	**Final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	New Headway Intermediate Students Book	No
Recommended Texts		
Websites	You can visit the course page at the following link: https://youtube.com/playlist?list=PLzQug2pV17x9JD3wR8mk5qst_1EQ1myF6	

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.

Ministry of Higher Education and Scientific Research - Iraq
Northern Technical University
Engineering Technical College/Mosul
Department of Computer Techniques Engineering

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	**Digital Circuits**	**Module Delivery**	
Module Type	Core	✓ **Theory** ✓ **Lecture** ✓ **Lab** ✓ **Tutorial** ✓ **Practical** ✓ **Seminar**	
Module Code	104		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	**Semester of Delivery**	2
Administering Department	**Department of Computer Techniques Engineering**	**College**	**Northern Technical University Engineering Technical College of Computer and Artificial Intelligence/Mosul**
Module Leader	Khalis A. Mohammed	**e-mail**	Khalis_am@ntu.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	21/09/2024	**Version Number**	1.0

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	**Digital Logic** BCTE101-S1	**Semester**	1
Co-requisites module	None	**Semester**	

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

Module Objectives أهداف المادة الدراسية	1. To learn the basic techniques and methodologies for designing and analyzing digital circuits such as Adder – subtractor circuits. 2. To learn the Decoder and Encoder circuits. 3. To learn the Comparator, Multiplexer and Demultiplexer circuits. 4. To learn and analysis sequential circuits such as flip-flop circuits and Registers. 5. To learn the types of counters.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Ability to design Adder and Subtractor circuits. • Knowledge of designing encoder and decoder circuits. • Knowledge the Comparator, Multiplexer, Demultiplexer and places of use. • Learn how to design an asynchronous and synchronous counters.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Part 1 – Functions of Combinational Logic. Half , Full and Parallel Binary Adders and Subtractors. 1's and 2's Complement Subtractor, 2's Complement Adder-Subtractor, BCD Adder, etc. Comparators, Decoders, Encoders, Multiplexers, Demultiplexer [14 hrs] • Part 2- Latches, Flip-Flops, and Timers. Latches, Edge-Triggered Flip-Flops. Flip-Flop operating (R-S, T, J-K ,D) [12 hrs] • Part 3 Counters Synchronous Counters, Asynchronous Counters. Design of Counters. [26 hrs] • Part 4 Shift Registers Basic Shift Register Operations: SISO, SIPO, PISO, PIPO, Bidirectional and special Types Shift Register. [10 hrs] • Revision problem classes [6 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

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

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	61	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	89	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	5% (5)	4,6,10	LO # 2, 10 and 11
	Assignments	3	5% (5)	2, 5,8	LO # 3, 4 and 7
	Lab.	14	10%(10)	Continuous	All
	Projects	3	5% (5)	3,9,11	LO # 5, 8 and 10
	Report	6	10% (10)	Continuous	All
	Seminars	3	5% (5)	4,10,12	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	1- Functions of Combinational Logic. Basic Adders; Half and Full Adders.
Week 2	1- Functions of Combinational Logic. Basic Subtractors; Half and Full Subtractors.
Week 3	1- Functions of Combinational Logic. Parallel Binary Adders and Subtractors. 1's ,2's Complement Subtractor, 2's Complement Adder-Subtractor, BCD Adder, etc.
Week 4	1- Functions of Combinational Logic. Comparators, Code converters.
Week 5	1- Functions of Combinational Logic. Decoders, Encoders.
Week 6	1- Functions of Combinational Logic. Multiplexers (Data Selectors), Demultiplexer.
Week 7	2- Latches, Flip-Flops, and Timers. Latches
Week 8	2- Latches, Flip-Flops, and Timers. Edge-Triggered Flip-Flops.
Week 9	2- Latches, Flip-Flops, and Timers. Flip-Flop operating (R-S, T, J-K ,D)
Week 10	3- Counters Synchronous Counters.
Week 11	3- Counters Asynchronous Counters.

Week 12	3- Counters Design of Counters.
Week 13	4- Shift Registers Basic Shift Register Operations. Serial In/Serial out Shift Registers. Serial In/Parallel out Shift Registers.
Week 14	4- Shift Registers Parallel In/Serial Out Shift Registers. Parallel In/parallel Out Shift Registers. Bidirectional Shift Registers.
Week 15	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Half Binary Adder
Week 2	Lab 2: Full Binary Adder
Week 3	Lab 3: Half Binary Subtractor
Week 4	Lab 4: Full Binary Subtractor
Week 5	Lab 5: 2's Complement Adder-Subtractor
Week 6	Lab 6: Binary Comparator
Week 7	Lab 7: Digital Multiplexer
Week 8	Lab 8: DeMultiplexer.
Week 9	Lab 9: Decoders
Week 10	Lab 10: Encoders
Week 11	Lab 11: D Flip-Flop
Week 12	Lab 12: JK- Flip-Flop
Week 13	Lab 13: T- Flip-Flop
Week 14	Lab 14: Review

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Thomas L. Floyd, Digital Fundamentals, 11th Edition, Pearson Education 2015	Yes
Recommended Texts	M. Morris Mano, Michael D. Ciletti, Digital Design, 5th edition, Pearson Education 2013	No
Websites	Digital Systems: From Logic Gates to Processors: https://www.coursera.org/learn/digital-systems	

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	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded

(0 – 49)	**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
Northern Technical University
Engineering Technical College/Mosul
Department of Computer Techniques Engineering

Module Descriptor Form

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	**Engineering Mathematics**	**Module Delivery**	
Module Type	Basic	✓ **Theory** ✓ **Lecture** **Lab** ✓ **Tutorial** **Practical** **Seminar**	
Module Code	CTE105		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	**Semester of Delivery**	2
Administering Department	**Department of Computer Techniques Engineering**	**College**	**Northern Technical University Engineering Technical College of Computer and Artificial Intelligence/Mosul**
Module Leader	Ayhan A. khaleel	**e-mail**	Ay_ahmed@ntu.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	21/09/2024	**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 Objectives أهداف المادة الدراسية	Mathematics is an important tool for understanding modern and scientific technologies, and the modern world today relies heavily on mathematics. Mathematics is also characterized by multiple benefits, including that it is an intellectual tool, a strong communication method, and it is in itself a way of thinking, through which the capabilities of individuals develop, and it helps us in advanced logical thinking. It also Introduce students to mathematics through the laws and issues necessary for the purpose of assisting them in their studies in their field of specialization .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	16. Learning about the complex numbers. 17. Learning the Functions of several variables. 18. Learning the Lines and planes in space, Tangent and normal in the plane 19. Learning the Triple integrals in rectangular coordinates 20. Double Integral in rectangular and polar form, Areas and volumes 21. Applications (Surface Area, Green's theorem and Stokes' theorem
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: ❖ Complex Numbers– For most students the assumptions I've made above about their exposure to complex numbers is the extent of their exposure. Problems tend to arise however because most instructors seem to assume that either students will see beyond this exposure in some later class or have already seen beyond this in some earlier class. Students are then suddenly expected to know more than basic arithmetic of complex numbers but often haven't actually seen it anywhere and have to quickly pick it up on their own in order to survive in the class. [13 hrs] ❖ Vector Fields – In this section we introduce the concept of a vector field and give several examples of graphing them. We also revisit the gradient that we first saw a few chapters ago. Line Integrals – Part I – In this section we will start off with a quick review of parameterizing curves. This is a skill that will be required in a great many of the line integrals we evaluate and so needs to be understood. We will then formally define the first kind of line integral we will be looking at : line integrals with respect to arc length. Line Integrals – Part II – In this section we will continue looking at line integrals and define the second kind of line integral we'll be looking at : line integrals with respect to x, y, and/or z. We also introduce an alternate form of notation for this kind of line integral that will be useful on occasion. Line Integrals of Vector Fields – In this section we will define the third type of line integrals we'll be looking at : line integrals of vector fields. We will also see that this particular kind of line integral is related to special cases of the line integrals with respect to x, y and z. [20 hrs] ❖ Part D: Multiple Integrals - In this chapter will be looking at double integrals, i.e. integrating functions of two variables in which the independent variables are from two dimensional regions, and triple integrals, i.e. integrating functions of three variables in which the independent variables are from three dimensional regions. Included will be double integrals in polar coordinates and triple integrals in cylindrical and spherical coordinates and more generally change in variables in double and triple integrals.[20 hrs] ❖ Revision problem classes [6 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in the delivery of this unit is to encourage students to participate in exercises, while improving and expanding their mathematical reasoning skills.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	61	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	64	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	20% (25)	5, 7, 9, 11	LO #1, 2, 10 and 11
	Assignments	8	16% (10)	Continuous	All
	Projects / Lab.	0	0		
	Report	1	4%(20)		
Summative assessment	**Midterm Exam**	2 hr	10% (20)	7	LO # 1-7
	Final Exam	3 hr	50% (60)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	COMPLEX NUMBERS IN CARTESIAN COORDINATES AND POLAR FROM
Week 2	LINEAR ALGEBRA FOR COMPLEX NUMBER IN POLAR AND CARTESIAN EULER'S FORMULA.
Week 3	DEMOIVRE'S THEOREM TO FIND POWERS AND THE NTH ROOTS OF GIVEN COMPLEX NUMBERS
Week 4	Functions of several variables
Week 5	Partial differentiation and the chain rule
Week 6	Functions of a complex variable, Cauchy-Riemann equations
Week 7	Cartesian coordinates and vectors in space, Dot product and Cross product
Week 8	Lines and planes in space, Tangent and normal in the plane
Week 9	The two-dimensional Coordinate system, The three dimensional Coordinate .
Week 10	Directional derivatives, Gradient vectors
Week 11	Divergence, curl and the laplacian
Week 12	Double Integral in rectangular and polar form, Areas and volumes
Week 13	Triple integrals in rectangular coordinates
Week 14	Applications (Surface Area, Green's theorem and Stokes' theorem)
Week 15	**Final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	**Advance Engineering Mathematics, Alan Jeffrey, 2002**	Yes
Recommended Texts	**Calculus II &Calculus III, Paul Dawkins, 2007**	No
Websites	https://tutorial.math.lamar.edu/Classes/CalcIII/CalcIII.aspx https://tutorial.math.lamar.edu/Classes/CalcII/CalcII.aspx	

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.

Ministry of Higher Education and
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Department of Computer Techniques Engineering

Module Descriptor Form

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	**Computer Programming**	**Module Delivery**	
Module Type	Core	✓ **Theory** ✓ **Lecture** ✓ **Lab** ✓ **Tutorial** ✓ **Practical** ✓ **Seminar**	
Module Code	TECCAI101		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	1	**Semester of Delivery**	1
Administering Department	**Department of Computer Techniques Engineering**	**College**	**Northern Technical University Engineering Technical College of Computer and Artificial Intelligence/Mosul**
Module Leader	Najwan Z. Waisi	**e-mail**	Najwan.tuhafi@ntu.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	21/09/2024	**Version Number**	1.0

Relation With Other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	
Co-requisites module	Object Oriented Programming	**Semester**	S3

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	Introduce the students with computer programming techniques using C++ language, and how it can be used to solve problems related to their specialization.
Module Learning	The learning outcomes for a module on computer programming in C++ can vary depending

Outcomes مخرجات التعلم للمادة الدراسية	on the specific objectives of the course or program: 1-Understanding the basics of C++: Students should be able to comprehend the fundamental concepts of C++ programming, including syntax, data types, variables, operators, control structures, and functions. 2-Proficiency in C++ programming: Students should develop the skills required to write, compile, and execute C++ programs. They should be able to implement various programming constructs and algorithms using C++. 3-Problem-solving and algorithm design: Students should gain the ability to analyze problems and design efficient algorithms to solve them using C++. They should be able to break down complex problems into smaller, manageable tasks and implement them in code. 4-Debugging and error handling: Students should develop skills in debugging C++ programs and identifying and fixing errors. They should learn techniques for error handling, exception handling, and writing robust code. 5-Code optimization and efficiency: Students should be able to optimize their C++ code for efficiency, considering factors such as algorithm complexity, data structures, and code organization. They should learn about performance analysis and profiling tools to identify bottlenecks in code. 6-Software development practices: Students should understand and apply good software development practices, including code documentation, version control, and testing. They should learn how to write readable and maintainable code.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Part A – Introduction to C++. [14 hrs] • Part B- Operators & Making Decisions [12 hrs] • Part C- Looping & Arrays [16 hrs] • Part D- Looping & Arrays [10 hrs] • Revision problem classes [6 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	When teaching and learning C++ programming, various strategies can be employed to enhance comprehension and mastery of the subject. Here are some effective learning and teaching strategies for C++ programming: Hands-on coding , Step-by-step approach , Visual aids and diagrams , Active learning , Real-world examples and projects , Online resources and coding platforms , Code documentation and commenting , Debugging and problem-solving techniques , Assessment and feedback , Continuous learning and staying updated

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	59	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	41	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	4% (4)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	15	10% (10)	Continuous	All
	Report	6	10% (10)	13	LO # 5, 8 and 10
	Seminar	1	6% (6)	5	
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	Introduction to C++ (Structure of a program)
Week 2	Variables, Data Types, Declaration of variables, Scope of variables, Initialization of variables, Expressions and Basic Input/Output.
Week 3	Operators (Assignment, Arithmetic operators, Compound assignment, Increase and decrease, Relational and equality operators, Conditional operator)
Week 4	Making Decisions (if...else and switch).
Week 5	Looping (while loop and for loop).
Week 6	Bitwise Operators and Explicit type casting operator
Week 7	Arrays (Single Dimensional arrays, Arrays as parameters)
Week 8	Arrays (two Dimensional arrays, Arrays as parameters)
Week 9	Character Sequences and String handling.
Week 10	Structure
Week 11	Pointers (Reference operator, dereference operator, Declaring variables of pointer types,)
Week 12	Pointers and arrays, Pointers to pointers, void pointers and Pointers to functions
Week 13	Functions (Local and global variables, Arguments passed by value and by reference, Default values in parameters)
Week 14	Overloaded functions and Recursive functions.
Week 15	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to C++ program using visual studio .
Week 2	Lab 2: my first program and how solve a problem.
Week 3	Lab 3: : if...else and switch programs
Week 4	Lab 4: while loop and for loop programs
Week 5	Lab 5: Bitwise Operators programs
Week 6	Lab 6: Single Dimensional arrays
Week 7	Lab 7: two Dimensional arrays ..part1
Week 8	Lab 8: two Dimensional arrays..part2
Week 9	Lab 9: : Character and String programs

Week 10	Lab 10: how implement a Structure
Week 11	Lab 11: Pointers and arrays
Week 12	Lab 12: Functions..part1
Week 13	Lab 13: Functions..part2
Week 14	Lab 14: Review

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	The Complete Reference, 4th Edition – Herbert schildt	No
Recommended Texts	complete c++ programming fundamentals with examples projects- emenwa global	No
Websites	non	

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.

Ministry of Higher Education and Scientific Research - Iraq
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Department of Computer Technology Engineering

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	Electronic Workshop	**Module Delivery**	
Module Type	Core		**Theory** **Lecture** ✓ **Lab** ✓ **Tutorial** ✓ **Practical** **Seminar**
Module Code	CTE107		
ECTS Credits	3		
SWL (hr/sem)	75		

Module Level	1	**Semester of Delivery**	2
Administering Department	**DEPARTMENT OF COMPUTER TECHNIQUES ENGINEERING**	**College**	**Northern Technical University Engineering Technical College of Computer and Artificial Intelligence/Mosul**
Module Leader	Thabat F. Thabet	**e-mail**	Thabet.tfy@ntu.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	PhD.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	10/09/2024	**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	6. To learn the basics of electrical elements (Symbols and Abbreviations, Units). 7. To learn how to use measurement devices for DC and AC 8. How to measure electrical elements by using measurement devices 9. To learn the basics of electronic devices

	10. How to test electronic devices by using measurement devices 11. How to use Oscilloscope (CRO) 12. How to use Function Generator
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	22. Learning about the electrical elements. 23. Learning about the electronic devices. 24. Learning about the measurement devices. 25. Learning about Oscilloscope and Function Generator 26. Learning about the integrated circuits. 27. Learning about the printed circuit board
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Part A – **Basic information and electrical elements [12 hrs]** Basic information Color of resistance Capacitors values Measurement devices How to measure resistors and capacitors values How to measure DC and AC values • Part B – **Electronic devices and AC circuits [10 hrs]** Diodes Transistors. Operating of Oscilloscope Function Generator DC and AC circuit • Part C – **Circuit Implementation [6 hrs]** Electric circuit schematic diagram Integrated circuits Printed circuit board Review [2 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

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

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	30	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	45	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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**	2/6	30% (30)	2, 4, 5, 7, 8 and 10	LO # 1, 2, 3 and 4
	Assignments	1/4	10% (20)	3, 11, 12 and 13	LO # 1, 2, 4, 5 and 6
	Projects	5/1	10% (10)	14	all
	Report	3/4	20% (20)	4, 5, 6 and 9	LO # 1, 2, 3 and 4
	LAB.	10/4	20% (20)	3-12	all

Total assessment	100% (100 Marks)		

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Basic information
Week 2	Lab 2: Color of resistance
Week 3	Lab 3: Capacitors values
Week 4	Lab 4: Measurement devices
Week 5	Lab 5: How to measure resistors and capacitors values
Week 6	Lab 6: How to measure DC and AC values
Week 7	Lab 7: Diodes
Week 8	Lab 8: Transistors.
Week 9	Lab 9: Operating of Oscilloscope
Week 10	Lab 10: Function Generator
Week 11	Lab 11: DC and AC circuit
Week 12	Lab 12: Electric circuit schematic diagram
Week 13	Lab 13: Integrated circuits
Week 14	Lab 14: Printed circuit board
Week 15	Lab 15: Review

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	ELECTRONIC WORKSHOP & PCB LAB MANUAL	Yes
Recommended Texts	Integrated Circuits	Yes
Websites	https://www.youtube.com/watch?v=YJr-kHy6STg https://www.youtube.com/watch?v=VxMV6wGS3NY:	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** – Excellent	امتياز	90 - 100	Outstanding Performance
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Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

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
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Department of Computer Techniques Engineering

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	**electrical Circuits**	**Module Delivery**	
Module Type	Core	✓ **Theory** ✓ **Lecture** ✓ **Lab** ✓ **Tutorial** ✓ **Practical** ✓ **Seminar**	
Module Code	CTE106		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	1	**Semester of Delivery**	2
Administering Department	**Department of Computer Techniques Engineering**	**College**	**Northern Technical University Engineering Technical College of Computer and Artificial Intelligence/Mosul**
Module Leader	Maysaloon Abed Qasim	**e-mail**	Maysloon.alhashim@ntu.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	PHD
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	21/09/2024	**Version Number**	1.0

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	**electrical Circuits**	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1-Understand the fundamental concepts and principles of alternating current (AC) circuits. 2-Gain knowledge of the mathematical tools and techniques used to analyze AC circuits, including phasors, complex numbers, and impedance. 3-Develop the ability to solve AC circuit problems using circuit analysis techniques such as mesh analysis, nodal analysis, and Thevenin's theorem.. ect. 4-Learn how to calculate and analyze voltage and current phasors in AC circuits, including their amplitudes, phases, and frequency relationships. 5-Explore the behavior and characteristics of AC circuit elements, such as resistors, capacitors, and inductors, and understand their roles in AC circuit analysis. 6-Investigate the concept of impedance in AC circuits and its relationship to resistance, reactance, and frequency. 7-Study the principles of AC power and power factor, including real power, reactive power, apparent power, and power factor correction. 8- Gain a comprehensive understanding of three-phase AC systems, including the generation, transmission, and distribution of power in three-phase circuits.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-Knowledge Acquisition: Students will acquire a comprehensive understanding of the fundamental concepts and principles of alternating current (AC) circuits. 2-Circuit Design and Analysis: Students will gain the ability to design and analyze AC circuits, applying their knowledge of impedance, power factor, and component characteristics. They will learn to calculate voltage and current magnitudes, phase differences, and power relationships in AC circuits. 3-Phasor Diagram Interpretation: Students will be able to construct and interpret phasor diagrams to visualize and analyze the behavior of voltages and currents in AC circuits. 4-Three-Phase Systems: Students will acquire understanding of three-phase AC systems, including balanced and unbalanced configurations. Laboratory Skills: Students will develop practical skills in using circuit simulation software and laboratory equipment to design, analyze, and verify the performance of AC circuits.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Part A – Inductance & Capacitance in Electric circuits. General concept of capacitance (charge and voltage, capacitors in series and parallel) General concept of inductance (inductive and non-inductive circuits, capacitors in series and parallel) [4 hrs] • Part B Alternating Quantities. Ac systems, waveforms, terms and definitions. Average and R.M.S values of current and voltage. [10 hrs] • Part C Single - phase of AC Circuits. AC in resistive circuits, current and voltage in inductive circuits, current and voltage in capacitive circuits. Concept of complex impedance and admittance, AC series and parallel circuits. RL, RC and RLC circuit analysis and phasor representation. [12 hrs] • Part D Power in AC circuits. Power in resistive circuits. power in inductive and capacitive circuits ,power in circuit with resistance and reactance. Power factor, its practical importance, improvement of power factor, measurement of power in a single – phase AC circuits. [16 hrs]

	• Part E Three – phase circuit analysis. Basic concept and advantages of three – phase circuit. Phasor representation of star and delta connection. Phase and line quantities. Voltage and current computation in 3-phase balance and unbalance circuits. Real and Reactive power computation, measurement of power and power factor in 3-phase system. [12 hrs] • Revision problem classes [4 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	1-Conceptual Understanding: Explain the differences between AC and DC circuits, introduce the concept of impedance, reactance, and phasors, and highlight the significance of frequency and phase in AC circuits. 2-Mathematical Foundations: Provide a solid mathematical foundation for AC circuits. Teach students the use of complex numbers and phasor notation to analyze AC circuits. 3-Problem-Solving Skills: Dedicate adequate time to problem-solving exercises and examples. 4-Laboratory Experiments: Incorporate laboratory experiments to reinforce theoretical concepts. Allow students to build and analyze AC circuits using oscilloscopes, function generators, and AC power sources. 5-Simulation Tools: Introduce simulation software tools that allow students to simulate AC circuits and observe their behavior. 6-Review and Assessment: Regularly review key concepts and provide formative assessments to gauge students' understanding. Offer constructive feedback on their performance to help them identify areas for improvement.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	58	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	117	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	3	5% (5)	5,7 ,10	LO #1, 2, 10 and 11
	Assignments	3	5% (5)	2,9 ,12	LO # 3, 4, 6 and 7
	Lab.	14	10%(10)	Continuous	All
	Projects	3	5% (5)	2,9 ,12	LO # 3, 4, 6 and 7
	Report	8	10% (10)	Continuous	All
	Seminars	3	5% (5)	3,10 ,13	LO # 3, 4, 6 and 7
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	1- **Inductance & Capacitance in Electric circuits.** 1-General concept of capacitance (charge and voltage, capacitors in series and

	parallel) 2- General concept of inductance (inductive and non-inductive circuits, capacitors in series and parallel)
Week 2	2- **Alternating Quantities.** Ac systems, waveforms, terms and definitions.
Week 3	2- **Alternating Quantities.** Average and R.M.S values of current and voltage.
Week 4	2- **Alternating Quantities.** Phasor diagram
Week 5	3- **Single - phase of AC Circuits.** AC in resistive circuits , current and voltage in inductive circuits, current and voltage in capacitive circuits.
Week 6	3- **Single - phase of AC Circuits.** Concept of complex impedance and admittance , AC series and parallel circuits .
Week 7	3- **Single - phase of AC Circuits.** RL , RC and RLC circuit analysis and phasor representation.
Week 8	4- **Power in AC circuits.** Power in resistive circuits ,power in inductive and capacitive circuits ,power in circuit with resistance and reactance.
Week 9	4- **Power in AC circuits.** Power factor ,its practical importance , improvement of power factor , measurement of power in a single – phase AC circuits.
Week 10	5- **Three – phase circuit analysis.** Basic concept and advantages of three – phase circuit.
Week 11	5- **Three – phase circuit analysis.** Phasor representation of star and delta connection.
Week 12	5- **Three – phase circuit analysis.** Phase and line quantities.
Week 13	5- **Three – phase circuit analysis.** Voltage and current computation in 3-phase balance and unbalance circuits.
Week 14	5- **Three – phase circuit analysis.** Real and Reactive power computation , measurement of power and power factor in 3-phase system.
Week 15	**Final Exam.**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Measurement amplitude, frequency and time with oscilloscope using hardware and digital simulation.
Week 2	Lab 2: Examine phase relation in RL & RC circuit using hardware and digital simulation.
Week 3	Lab 3: Calculate & verify average and RMS value,
Week 4	Lab 4: Impedance of series RL and RC circuit using digital simulation..

Week 5	Lab 5: Impedance of series RLC circuit using digital simulation..
Week 6	Lab 6: Determination of average value, RMS value, form factor, peak factor of sinusoidal wave using digital simulation.
Week 7	Lab 7: Measure currents and voltages in three-phase balanced AC circuits
Week 8	Lab 8: Prove Y-Δ transformation,
Week 9	Lab 9: Exercise on phasor diagrams for three-phase circuits
Week 10	Lab 10: Measurement of voltage, current& power in a three-phase circuit
Week 11	Lab 11: Ohm's LAW, KVL AND KCL in AC circuits using digital simulation..
Week 12	Lab 12: Determination of mesh currents in AC circuits using digital simulation.
Week 13	Lab 13: Measurement of nodal voltages in AC circuits using digital simulation.
Week 14	Lab 14: Review

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Charles K. Alexander, Matthew N.O. Sdiku Fundamentals of Electrical Engineering, 4th Edition, 2009	Yes
Recommended Texts	Tony R. Kuphaldt, Lessons In Electric Circuits, Volume II - AC 5th edition, 2002	No
Websites	AC circuits https://byjus.com/physics/ac-circuit/	

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.

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Computer Principles			**Module Delivery**	
Module Type	Supported			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☒ **Practical** ☒ **Seminar**	
Module Code	NTU102				
ECTS Credits	3				
SWL (hr/sem)	30				
Module Level	**First**		**Semester of Delivery**	**First**	
Administering Department	**Med. Ins. Tech. Eng.**		**College**	**Northern Technical University** **Engineering Technical College of Computer and Artificial Intelligence/Mosul**	
Module Leader	**Zaid Abdulsattar Abdulrazzaq**		**e-mail**	zaid.a.abdulrazzaq@ntu.edu.iq	
Module Leader's Acad. Title	**Assistant Lecturer**		**Module Leader's Qualification**	**Master**	
Module Tutor	**Name (if available)**		**e-mail**	**E-mail**	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	**01/09/2024**		**Version Number**	**1.0**	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	N/A	**Semester**	2
Co-requisites module	N/A	**Semester**	2

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Studying computer principles. 2. Defining keyboards and mice. 3. Presenting principles of memories.

	4. Explaining disc drives. 5. Explaining principles of windows. 6. Illustrating accessories of windows.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Abilities to recognize different computer hardware parts. 2. Defining various types of keyboards and mice. 3. Getting knowledge about computer memories and drives. 4. Getting knowledge about windows. 5. Presenting different windows accessories.
Indicative Contents المحتويات الإرشادية	• Indicative content includes the following. • Computer types of: digital, analogues and hybrid. • Different memory types of: RAM, ROM, PROM, EPROM and EEPROM. • Different drives types of: magnetic and optical. • Windows facilities of: Notepad, Wordpad, Paint, Accessories and others.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Strategies that will be adopted for delivering this module are theoretical lectures, practical experiments, home works and exams. This will be achieved through classes, interactive tutorials and by considering practical experiments.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	43	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	32	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
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)	4,7	LO #2, #4
	Assignments	2	10% (10)	10	LO #1, #3, #5
	Projects / Lab.	15	10% (10)	Continuous	All
	Report	8	10% (10)	9	LO #3
Summative assessment	**Midterm Exam**	2hr	10% (10)	10	All
	Final Exam	3hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
1st	**Introducing to the Computer System Including: What is Computer? Computer System, Functions of Computer Input Storage Process & Output, Classification of Computers and Computer Units**
2nd, 3rd, 4th	**Explaining Types of Computer Keyboards and Types of Keyboard Keys**
5th	**Explaining Types of Computer Mice and Mouse Functions**
6th	**Explaining Different Plugs and Ports for Some Computer Parts**
7th	**Illustrating Computer Discs and Drives**
8th	**Illustrating RAM, Non-Volatile and Cache Memories**
9th, 10th, 11th	**Demonstrating Computer Hardware Parts and Definitions**
12th, 13th	**Presenting Windows, Windows Desktop and Windows Taskbar**
14th, 15th	**Illustrating Start Menu and Windows Accessories**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
1st	**Introducing to the Computer System Including: What is Computer?, Computer System, Functions of Computer Input Storage Process & Output, Classification of Computers and Computer Units**
2nd, 3rd, 4th	**Explaining Types of Computer Keyboards and Types of Keyboard Keys**
5th	**Explaining Types of Computer Mice and Mouse Functions**
6th, 7th	**Explaining Different Plugs and Ports for Some Computer Parts, and Illustrating Computer Discs and Drives**
8th	**Illustrating RAM, Non-Volatile and Cache Memories**
9th, 10th, 11th, 12th	**Demonstrating Computer Hardware Parts and Definitions, and Presenting Windows, Windows Desktop and Windows Taskbar**
13th, 14th, 15th	**Illustrating Start Menu and Windows Accessories**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	[1] Umar Farooq, "What is Computer - Definition & Basic Concept of Computer", Study Lecture Notes, 2016. [2] University Information Technology Services, "Microsoft Windows 10, Getting Started Guide", Kennesaw State University – UITS, 2016.	In the internet
Recommended Texts	Cre8te Opportunities, "Introduction to Computers (Windows 10)", Digital Skills Academy, 2016.	In the internet
Websites	[1] http://www.studylecturenotes.com/computer-science/what-is-computer-definition-basic-concept-of-computer [2] http://ergonomictrends.com/different-types-of-computer-keyboards/ [3] UKEssays, "Wireless Mouse: History and Types", 2018. [Online]. Available: https://www.ukessays.com/essays/computer-science/wireless-mouse-history-types-5302.php?vref=1. [4] https://searchstorage.techtarget.com/definition/RAM-random-access-memory [5] https://tldp.org/HOWTO/Network-boot-HOWTO/a610.html#:~:text=PROM%3A%20Pronounced%20prom%2C%20an%20acronym,the%20computer%20is%20turned%20off.	

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
Northern Technical University
Engineering Technical College/Mosul
Department of Computer Techniques Engineering

Module Descriptor Form

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	**Arabic Language**	**Module Delivery**	
Module Type	Suplement	✓ **Theory** ✓ **Lecture** **Lab** **Tutorial** **Practical** ✓ **Seminar**	
Module Code	NTU103		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	2	**Semester of Delivery**	2
Administering Department	**Department of Computer Techniques Engineering**	**College**	**Northern Technical University Engineering Technical College of Computer and Artificial Intelligence/Mosul**
Module Leader	**Dr. Eesha I. Mohammed**	**e-mail**	aysha.ibrahim@ntu.edu.iq
Module Leader's Acad. Title	Assist. Prof.	**Module Leader's Qualification**	PHD
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	21/09/2024	**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 Objectives أهداف المادة الدراسية	ينشأ الطالب على حب اللّغة العربيّة لغة القرآن الكريم. التعرّف على مواطن الجمال في اللّغة العربيّة وآدابها، وأن يكتسب الطالب القدرة على دراسة فروع اللّغة العربيّة. تعريف الطالب بألفاظ اللّغة العربيّة الصحيحة وتراكيبها وأساليبها السليمة بطريقة مشوقة وجذابة. أن يستغل الطالب وقت فراغه بالقراءة والاطلاع والرجوع إلى المكتبة . تمكين الطالب من القراءة الصحيحة، وأن يكتسب القدرة على استعمال اللغة استعمالاً صحيحاً في الاتّصال مع الآخرين؛ كالسرعة وجودة الإلقاء وحسن التعبير، وتعويده حسن الاستماع لما يسمع مما ييسّر له أموره ويعينه على قضاء حوائجه. تنمية الذوق الأدبي لدى الطالب حتى يدرك النواحي الجمالية في أساليب الكلام ومعانيه وصوره. تعويد الطالب التعبيرات السليمة الواضحة عن أفكاره وما يقع تحت حواسه نطقاً وكتابة وحسن استخدام علامات الترقيم. تنمية قدرة ومهارة الطالب الإملائية والخطية بحيث يستطيع الكتابة الصحيحة من جميع النواحي. إيقاظ وعي الطالب لإدراك شرف الكلمة وتوجيهه؛ للمحافظة على طهارتها ونقائها حتى لا تستعمل إلا في الخير. مساعدة الطالب على فهم التراكيب المعقدة والأساليب الغامضة .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. معرفة القواعد النحوية والصرفية. 2- التعريف بأبرز المصنفات اللغوية والأدبية. 3- تحديد المشكلات اللغوية والأدبية لدى الدارسين. 4- القراءة المعاصرة للنصوص اللغوية والأدبية. 5- قراءة النصوص الأدبية وكتابتها وفق المعايير النحوية والصرفية 6- تعزيز الثقة بالنفس والجرأة والفصاحة 7- المنافسة والتميز في سوق العمل.

Indicative Contents المحتويات الإرشادية	❖ مقدمة عن الأخطاء اللغوية التاء المربوطة والتاء المفتوحة (4 ساعات) ❖ تطبيقات الأخطاء اللغوية الشائعة واقسام الكلام (6 ساعات) ❖ همزة الوصل والقطع والهمزة المتوسطة والمتطرفة قواعد كتابة الالف الممدودة والمقصورة الحروف الشمسية والقمرية والضاد والظاء (12 ساعة) ❖ المشاكل والمعوقات ونقاشات (6 ساعات)

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	1- .تبسيط المعلومات وتنظيمها 2- .تسهيل عملية استرجاع المعلومات 3- ربط المفاهيم الجديدة بالمكتسبات السابقة 4- .إيجاد العلاقة بين المفاهيم 5 - تسهيل تذكر المعارف والمعلومات

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	31	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	19	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	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 #1, 2, 10 and 11
	Assignments	10	10% (10)	Continuous	All
	Seminar	1	10% (10)	8	#10
	Report	1	10% (10)	Continuous	All
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	مقدمة عن الأخطاء اللغوية
Week 2	التاء المربوطة والتاء المفتوحة
Week 3	همزة الوصل والقطع
Week 4	الهمزة المتوسطة والمتطرفة
Week 5	قواعد كتابة الالف الممدودة والمقصورة
Week 6	الحروف الشمسية والقمرية
Week 7	الضاد والظاء
Week 8	العـــدد

Week 9	المفاعيل
Week 10	أقسام الكلام
Week 11	معاني حروف الجر
Week 12	تطبيقات الأخطاء اللغوية الشائعة
Week 13	النون والتنوين
Week 14	مقدمة عن الأخطاء اللغوية
Week 15	الامتحان النهائي

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	الكامل في اللغة والادب لابي عباس المبرد	Yes
Recommended Texts	أخطاء لغوية شائعة لخالد بن هلال بن ناصر العبري	No
Websites	https://www.eshamel.ne https://www.ektebsa7.com	

APPENDIX:

GRADING SCHEME
مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
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Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
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Note:

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Engineering Technical College/Mosul
Department of Computer Techniques Engineering

Module Descriptor Form

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	**Microprocessors**	**Module Delivery**	
Module Type	Core	✓ **Theory** ✓ **Lecture** ✓ **Lab** ✓ **Tutorial** ✓ **Practical** ✓ **Seminar**	
Module Code	CTE200		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	2	**Semester of Delivery**	1
Administering Department	**Department of Computer Techniques Engineering**	**College**	**Northern Technical University Engineering Technical College of Computer and Artificial Intelligence/Mosul**
Module Leader	Ahmad F. Al-Allaf	**e-mail**	Ahmed.faleh@atu.edu.iq
Module Leader's Acad. Title	Assistant Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	13/09/2024	**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 Objectives أهداف المادة الدراسية	13. Understanding Microprocessor Architecture: The course provides a comprehensive understanding of microprocessor architecture, including its components, data path, control unit, memory hierarchy, and input/output systems. Students will learn about different microprocessor families and their characteristics. 14. Instruction Set Architecture (ISA): Students gain proficiency in understanding and working with the instruction set architecture of a microprocessor. This involves learning about different instruction formats, addressing modes, data types, and the relationship between instructions and the underlying hardware. 15. Assembly Language Programming: The course cover assembly language programming for a specific microprocessor. Students learn the syntax, conventions, and techniques for writing efficient assembly language programs. They also understand the translation process from assembly language to machine code.
Module Learning Outcomes مخرجات التعلم للمادة	28. Understand the fundamental concepts and principles of microprocessor architecture, including the components, data path, control unit, memory hierarchy, and input/output systems. 29. Analyze and interpret the instruction set architecture (ISA) of a microprocessor,

الدراسية	including instruction formats, addressing modes, data types, and the relationship between instructions and hardware. 30. Demonstrate proficiency in writing and debugging assembly language programs for a specific microprocessor, considering syntax, conventions, and efficient programming techniques.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Part-A: Introduction to Microprocessor: Introduction and History of Microprocessors, Basic Block Diagram of a Microprocessor, Organization of Microprocessor Based System, Bus Organization, Processing Cycle of a Stored Program Computer. 8085 Microprocessor: Internal Architecture and Features of 8085 microprocessor, pin description. [6hrs.] • Part-B: 8086/8088 Microprocessor: Internal Architecture and Features of 8086/8088 Microprocessor, components of BIU and EU. Pin descriptions and bus cycles. Pin descriptions and bus cycles, 8284 clock generator and 8288 bus controller circuits, Minimum and Maximum configurations, Memory and I/O organization, [24hrs] • Part-C: 8086 programming and instruction sets: 8086 Addressing Modes, instruction groups, Data Movement instructions, Arithmetic and logical instructions, Jump instructions, String instructions, example. [24hrs] • Part -D : Different Microprocessor Architectures: Register Based and Accumulator Based Architecture, RISC and CISC Architectures, Digital Signal Processors. [4hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

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

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	61	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	114	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7.6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	8	10% (10)	3, 6, 9,12	LO #1, 2, 10 and 11
	Assignments	8	10% (10)	4, 7,10,13	LO # 3, 4, 6 and 7
	Projects / Lab.	15	10% (10)	Continuous	All
	Report	8	10% (10)	3,5,7,9	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	3,7,10,13	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	1-Introduction to Microprocessor: Introduction and History of Microprocessors, Basic Block Diagram of a Microprocessor, Organization of Microprocessor Based System, Bus Organization, Processing Cycle of a Stored Program Computer.
Week 2	2-8085 Microprocessor: Internal Architecture and Features of 8085 microprocessor, pin description.
Week 3	3-8086/8088 Microprocessor: Internal Architecture and Features of 8086 Microprocessor, components of BIU and EU.
Week 4	4-8086 Microprocessor: Pin descriptions and bus cycles.
Week 5	5-8086 Microprocessor: Pin descriptions and bus cycles.
Week 6	6-8086 Microprocessor: 8284 clock generator and 8288 bus controller circuits
Week 7	7-8086 Microprocessor: Minimum and Maximum configurations, Memory and I/O organization.
Week 8	8-8086 programming and instruction sets 8086 Addressing Modes, instruction groups
Week 9	9-8086 instruction sets: Data Movement instructions
Week 10	10-8086 instruction sets: Arithmetic and logical instructions
Week 11	11-8086 instruction sets: Jump instructions
Week 12	12-8086 instruction sets: String instructions
Week 13	13-8086 instruction sets: Programming examples
Week 14	14-Different Microprocessor Architectures: Register Based and Accumulator Based Architecture, RISC and CISC Architectures, Digital Signal Processors.
Week 15	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to debugging program
Week 2	Lab 2: 8086 instruction formats
Week 3	Lab 3: 8086 addressing modes
Week 4	Lab 4: Program examples of Data movement instructions
Week 5	Lab 5: Program examples of Arithmetic instructions
Week 6	Lab 6: Program examples of Arithmetic instructions (addition and subtraction)
Week 7	Lab 7: Program examples of Arithmetic instructions (Multiplication and division)
Week 8	Lab 8: Program examples of logical instructions
Week 9	Lab 9: Program examples of shift and rotate instructions
Week 10	Lab 10: Program examples of timing delay using counters
Week 11	Lab 11: Program examples of JMPs instructions
Week 12	Lab 12: Program examples of stack instructions
Week 13	Lab 13: Program examples of strings instructions

Week 14	Lab 14: Program examples of call and return instructions

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	The Intel Microprocessors (8th Edition), BARRY B. BREY, 2009	No
Recommended Texts	MICROPROCESSOR 8086 Architecture, Programming and Interfacing, **Sunil Mathur, 2011**	No
Websites	Digital Systems: From Logic Gates to Processors: https://www.coursera.org https://www.edx.org https://ocw.mit.edu	

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.

Ministry of Higher Education and Scientific Research - Iraq
Northern Technical University
Engineering Technical College/Mosul
Department of Computer Technology Engineering

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	Analog Electronics Fundamentals	**Module Delivery**	
Module Type	Core	✓ **Theory** ✓ **Lecture** ✓ **Lab** ✓ **Tutorial** ✓ **Practical** ✓ **Seminar**	
Module Code	CTE201		
ECTS Credits	5		
SWL (hr/sem)	125		

Module Level	2	**Semester of Delivery**	1
Administering Department	DEPARTMENT OF COMPUTER TECHNIQUES ENGINEERING	**College**	**Northern Technical University Engineering Technical College of Computer and Artificial Intelligence/Mosul**
Module Leader	Thabat F. Thabet	**e-mail**	Thabet.tfy@ntu.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	PhD.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	10/09/2024	**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	16. To learn the physics of material and the basics of electronic devices. 17. Study the structure and the characteristics of electronic devices (diodes and transistors). 18. To learn the applications of different types of diodes. 19. Study the principles of binary junction transistors (BJT), biasing, cutoff, saturation,

	operating point and DC load line.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	31. Learning about the physics of material. 32. Learning about the different electronic devices (structure and characteristics). 33. Ability to recognize and test different electronic devices (diodes and transistors). 34. Learning about the applications of diodes (circuits and their functions). 35. Ability to design, and implement different diode circuits (with a specific required output). 36. Ability to design, or analyze BJT biasing circuits to know the operating point.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Part A – **Introduction to electronics** Physics of material, atoms, electrons and energy bands, types of material (insulators, conductors, and semiconductors), N-type and P-type semiconductor. Diodes, forward bias, reverse bias, V-I characteristics [8 hrs] • Part B- **Application of diodes.** Half-wave rectifier, average value, r.m.s. value, capacitor filter, ripple voltage. Full-wave rectifier, average value, r.m.s. value, capacitor filter, ripple voltage. Half-wave rectifier, average value, r.m.s. value, capacitor filter, ripple voltage. Diode limiters, output voltage signal. Clampers and Voltage Doubler. [16 hrs] • Part C **Other types of diodes** Zener diodes, V-I characteristics. Voltage regulators using Zener diode (variable input voltage, and variable load). Zener limiters. Special purpose diodes, Varactor, Light Emitting diode LED, Photo diode, Schottky diode, Tunnel diodes. [16 hrs] • Part D **Transistors** Bipolar junction transistor BJT, current, voltages, and parameters, maximum ratings. BJT biasing, cutoff, saturation, operating point. Transistor bias circuits, base-bias, voltage divider Transistor bias circuits, emitter-bias, collector-feedback. [16 hrs] • Revision problem classes [4 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

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

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	65	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.3
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**	4	10% (10)	3, 7, 11, 14	LO #2, 4, 5 and 6
	Assignments	6	10% (10)	3, 5, 7, 9, 11, 14	LO # 2, 4, 5 and 6

	Projects / Lab.	1	10% (10)	Continuous	All
	Report	5	10% (10)	5, 6, 8, 10, 13	LO # 2, 3, 4, 5 and 6
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	Introduction to electronics.
Week 2	Physic of diode. Diode's equivalent circuits.
Week 3	Application of diodes.
Week 4	Half-wave rectifier.
Week 5	Full-wave rectifier .
Week 6	Diode Limiters
Week 7	Clampers.
Week 8	Zener diode Characteristics.
Week 9	Voltage regulator using Zener diode.
Week 10	Another typed of diode.
Week 11	Physic of transistor: Bipolar junction transistor BJT.
Week 12	DC operation point.
Week 13	Transistor bias circuits.
Week 14	Transistor bias circuits.
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to the Electronic Laboratory
Week 2	Lab 2: Diode characteristics
Week 3	Lab 3: Half-wave rectifiers
Week 4	Lab 4: Full-wave rectifiers
Week 5	Lab 5: Filter for Half-wave rectifiers
Week 6	Lab 6: Filter for Full-wave rectifiers
Week 7	Lab 7: Clipping Circuits
Week 8	Lab 8: Clamper and Voltage Doubler
Week 9	Lab 9: Zener diode characteristics
Week 10	Lab 10: Voltage regulators using Zener diode
Week 11	Lab 11: Transistor Characteristics
Week 12	Lab 12: Transistor Biasing (part 1)
Week 13	Lab 13: Transistor Biasing (part 2)
Week 14	Lab 14: Review

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Thomas L. Floyd, Electronic Devices, 9th Edition, Pearson Education 2012	Yes

Recommended Texts	R. BOYLESTAD and L. NASHELSKY, "ELECTRONIC DEVICES AND CIRCUIT THEORY", 11th edition, Pearson Education , 2013	Yes
Websites	Digital Systems: From Logic Gates to Processors: https://www.coursera.org/learn/electronics	

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
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Ministry of Higher Education and
Scientific Research - Iraq
Northern Technical University
Engineering Technical College/Mosul
Department of Computer Techniques Engineering

Module Descriptor Form

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Object oriented programing	**Module Delivery**	
Module Type	Core	✓ **Theory** ✓ **Lecture** ✓ **Lab** x **Tutorial** ✓ **Practical** ✓ **Seminar**	
Module Code	CTE202		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	**Semester of Delivery**	1
Administering Department	**Department of Computer Techniques Engineering**	**College**	**Northern Technical University Engineering Technical College of Computer and Artificial Intelligence/Mosul**
Module Leader	Anmar Burhan Mohammed	**e-mail**	Anmar.salih@ntu.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	PhD.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	21/09/2024	**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 Objectives أهداف المادة الدراسية	20. • Understanding OOP Concepts: Gain a solid understanding of fundamental OOP concepts such as encapsulation, inheritance, and polymorphism. Learn how these concepts promote code reusability, modularity, and maintainability. 21. • Programming Language Proficiency: Develop proficiency in a specific programming language that supports OOP paradigms, such as Java, C++, Python, or C#. Learn the syntax, data types, control structures, and other language features necessary for implementing OOP concepts. 22. • Class and Object Creation: Learn how to create classes and objects, define

	attributes and behaviors, and establish relationships between objects using techniques like composition and aggregation. 23. • Encapsulation and Data Hiding: Understand the principles of encapsulation and data hiding to enforce proper access control and protect data integrity. Learn how to define public, private, and protected access levels for class members. 24. • Inheritance and Polymorphism: Explore inheritance, where classes can inherit properties and behaviors from other classes, and polymorphism, where objects can take on different forms depending on their context. Understand the benefits and use cases for these concepts. 25. • Abstraction and Interface Design: Learn how to create abstract classes and interfaces to define common behaviors and establish contracts for implementing classes. Understand the advantages of abstraction in managing complex systems. 26. • OOP Design Patterns: Study common design patterns used in OOP, such as the Singleton, Factory, Observer, and Strategy patterns. Learn how to apply these patterns to solve common software design problems. 27. • Error Handling and Exception Handling: Understand how to handle errors and exceptions in an OOP context. Learn techniques for graceful error recovery, exception propagation, and creating custom exceptions. 28. • OOP Software Development Practices: Gain familiarity with software development practices aligned with OOP, such as modular programming, code organization, and documentation. Learn about version control systems and collaboration tools commonly used in OOP projects. 29. • OOP Analysis and Design: Learn how to analyze and design software systems using OOP principles. Understand the importance of modeling techniques like class diagrams and sequence diagrams in the software development lifecycle.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	37. Understand the principles of Object-Oriented Programming 38. Design and implement classes and objects 39. Apply access modifiers to control class member visibility. 40. Utilize inheritance and polymorphism 41. Implement function overriding and virtual functions for runtime polymorphism. 42. Develop object-oriented programs and projects. 43. Develop larger projects that demonstrate effective use of OOP concepts.
Indicative Contents المحتويات الإرشادية	Introduction to Object-Oriented Programming (4 hours) C++ Basics and Syntax Review (6 hours) Encapsulation and Access Control (8 hours) Inheritance and Polymorphism (10 hours) Dynamic Memory Management (8 hours) Object Relationships and Composition (6 hours) Operator Overloading (6 hours) Exception Handling (6 hours) Templates and Generic Programming (8 hours) Advanced OOP Concepts (8 hours) Design Patterns (8 hours) Project Development (16 hours)

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	Understand the Core Concepts: Begin by grasping the fundamental principles of OOP, including encapsulation, inheritance, and polymorphism. Gain a clear understanding of how these concepts work together to create object-oriented systems. Hands-on Coding: Actively practice writing code in C++ to reinforce your understanding of OOP. Implement classes, objects, and inheritance hierarchies. Solve programming exercises and work on small projects to apply OOP concepts in practical scenarios.

	Read and Analyze Code Examples: Study well-written C++ code that utilizes OOP techniques. Analyze how classes and objects are structured, how inheritance is implemented, and how polymorphism is achieved. This will help you understand real-world applications of OOP. Work with Real-World Examples: Seek out real-world examples or case studies where OOP has been employed in C++ projects. Examine open-source projects or sample code to understand how OOP is used to solve complex problems and create modular, reusable code.

Student Workload (SWL)
الحمل الدراسي للطالب

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

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	8	10% (10)	5, 10	LO #1, 2, 6,7,8,9,10 and 11
	Assignments	8	10% (10)	2, 12	LO # 3, 4, 6, 7,9,10,12,14
	Projects / Lab.	16	10% (10)	Continuous	All
	Report	5	10% (10)	2,4,8 ,10and13	LO#2,4,8,10 and 13
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	Introduction to C++ and OOP Basics • Introduction to C++ programming language • Basic syntax, variables, and data types • Functions and control structures • Introduction to object-oriented programming (OOP) concepts: classes, objects, and methods
Week 2	Classes and Objects • Defining and declaring classes • Creating objects and using constructors • Encapsulation and access modifiers (public, private, protected) • Member functions and data members
Week 3	Inheritance and Polymorphism • Inheritance hierarchy and base/derived classes • Single inheritance and multiple inheritance • Polymorphism and function overriding • Abstract classes and pure virtual functions asses
Week 4	Dynamic Memory Allocation and Pointers • Dynamic memory allocation with new and delete • Introduction to pointers and references • Memory management and deallocation • Object lifetime and scope

Week 5	Operator Overloading • Overloading unary and binary operators • Overloading comparison and assignment operators • Friend functions and operator overloading • Best practices and guidelines for operator overloading
Week 6	Templates and Generic Programming • Introduction to templates and generic programming • Function templates and class templates • Template specialization • Standard Template Library (STL) containers and algorithms
Week 7	Exception Handling • Introduction to exception handling • try-catch blocks and handling exceptions • Throwing and catching exceptions • Exception specifications and best practices
Week 8	• Midterm exam
Week 9	File Handling and Streams • Input/output streams and file handling • Reading from and writing to files • Error handling and file status flags • Working with text and binary files
Week 10	Advanced OOP Concepts • Polymorphism and virtual functions • Virtual base classes and diamond problem • Type casting and runtime type identification (RTTI) • Object slicing and dynamic casting
Week 11	Standard Library Algorithms • Overview of the standard library algorithms • Sorting and searching algorithms • Numeric algorithms and iterators • Practical applications and usage examples
Week 12	Memory Management • Smart pointers: unique_ptr, shared_ptr, weak_ptr • Memory management strategies and pitfalls • Resource Acquisition Is Initialization (RAII) • Memory leaks and debugging techniques
Week 13	Namespaces and Organizing Code • Using namespaces for code organization • Creating and managing namespaces • Namespace conflicts and resolutions • Best practices for code modularization
Week 14	Namespaces and Organizing Code • Using namespaces for code organization • Creating and managing namespaces • Namespace conflicts and resolutions • Best practices for code modularization
Week 15	Review
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	• Introduction to C++ • Basic syntax, variables, and data types • Functions and control structures
Week 2	• Classes and Objects

	• classes, objects, and methods document analysis
Week 3	• Encapsulation and access modifiers (public, private, protected) • Member functions and data member
Week 4	• Introduction to templates and generic programming • Function templates and class templates
Week 5	• Template specialization • Standard Template Library (STL) containers and algorithms
Week 6	• Introduction to exception handling • try-catch blocks and handling exceptions
Week 7	• Introduction to exception handling • try-catch blocks and handling exceptions
Week 8	Midterm
Week 9	•OLID principles: Single Responsibility, Open-Closed, Liskov Substitution, Interface Segregation, Dependency Inversion
Week 10	Design patterns: overview and examples
Week 11	•Multithreading and concurrency in C++
Week 12	Assignment
Week 13	• Applying design principles to real-world scenarios Code refactoring and improvement
Week 14	Review
Week 15	Review
Week 16	Final Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Effective Modern C++: 42 Specific Ways to Improve Your Use of C++11 and C++14" by Scott Meyers. "C++ Primer" by Stanley B. Lippman, Josée Lajoie, and Barbara E. Moo. "Design Patterns: Elements of Reusable Object-Oriented Software" by Erich Gamma, Richard Helm, Ralph Johnson, and John Vlissides.	No
Recommended Texts	Online tutorials and documentation specific to advanced C++ programming and libraries.	No
Websites	https://www.w3schools.com/cpp/cpp_oop.asp	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
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Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

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
Northern Technical University
Engineering Technical College/Mosul
Department of Computer Techniques Engineering

Module Descriptor Form

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Applied Mathematics	**Module Delivery**	
Module Type	Basic	✓ **Theory** ✓ **Lecture** **Lab** ✓ **Tutorial** **Practical** ✓ **Seminar**	
Module Code	CTE203		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	2	**Semester of Delivery**	1
Administering Department	**Department of Computer Techniques Engineering**	**College**	**Northern Technical University Engineering Technical College of Computer and Artificial Intelligence/Mosul**
Module Leader	Ayhan A. khaleel	**e-mail**	Ay_ahmed@ntu.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc.
Module Tutor	None	**e-mail**	None

Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	21/09/2024	**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 Objectives أهداف المادة الدراسية	Mathematics is an important tool for understanding modern and scientific technologies, and the modern world today relies heavily on mathematics. Mathematics is also characterized by multiple benefits, including that it is an intellectual tool, a strong communication method, and it is in itself a way of thinking, through which the capabilities of individuals develop, and it helps us in advanced logical thinking. It also Introduce students to mathematics through the laws and issues necessary for the purpose of assisting them in their studies in their field of specialization .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	44. Learning about the basic Matrix and Determinants Learning the Gaussian and Gauss-Jordan elimination, rank of a matrix. 45. Learning the Eigen values and Eigenvectors 46. Learning the First order differential equations, variable separable, homogeneous, linear first order and exact differential equations 47. Convergence and the Divergence tests, Alternating series ,Absolute and conditional convergence 48. Power series and Taylor and Maclaurin series
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: **Part A –** Review of matrices and their properties, Complex matrices, Hermitian, skew-Hermitian and unitary matrices, Inverse matrices and elementary row operation, Gaussian and Gauss-Jordan elimination, rank of a matrix. Eigen values and Eigenvectors. [20 hrs] **Part B –** First order differential equations, variable separable, homogeneous, linear first order and exact differential equations. [10 hrs] **Part C –** Convergence and the Divergence tests, Alternating series ,Absolute and conditional convergence, Power series and Taylor and Maclaurin series. [10 hrs] Revision problem classes [7 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in the delivery of this unit is to encourage students to participate in exercises, while improving and expanding their mathematical reasoning skills.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	58	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3

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**	8	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	13	10% (10)	Continuous	All
	Projects / Lab.	0	0		
	Report	0	0		
Summative assessment	**Midterm Exam**	2 hr	20% (20)	7	LO # 1-7
	Final Exam	3 hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Review of matrices and their properties
Week 2	Complex matrices, Hermitian, skew-Hermitian and unitary matrices
Week 3	Inverse matrices and elementary row operation
Week 4	Gaussian and Gauss-Jordan elimination.
Week 5	rank of a matrix
Week 6	Eigen values and Eigenvectors.
Week 7	First order differential equations, variable separable, homogeneous
Week 8	linear first order and exact differential equations
Week 9	Non-homogeneous second order with constant coefficients
Week 10	Convergence and the Divergence tests-part1
Week 11	Convergence and the Divergence tests-part2
Week 12	Alternating series ,Absolute and conditional convergence
Week 13	Power series
Week 14	Taylor and Maclaurin series
Week 15	**Final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	**Advance Engineering Mathematics, Alan Jeffrey, 2002**	Yes
Recommended Texts	**Calculus II &Calculus III, Paul Dawkins, 2007**	No
Websites	https://tutorial.math.lamar.edu/Classes/CalcIII/CalcIII.aspx https://tutorial.math.lamar.edu/Classes/CalcII/CalcII.aspx	

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.

Ministry of Higher Education and Scientific Research - Iraq
Northern Technical University
Engineering Technical College/Mosul
Department of Computer Techniques Engineering

Module Descriptor Form

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Data Structure		**Module Delivery**		
Module Type	Core		✓ **Theory** ✓ **Lecture** ✓ **Lab** **x** **Tutorial** ✓ **Practical** ✓ **Seminar**		
Module Code	CTE204				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	2		**Semester of Delivery**	1	
Administering Department	**Department of Computer Techniques Engineering**		**College**	**Northern Technical University Engineering Technical College of Computer and Artificial Intelligence/Mosul**	
Module Leader	Mohand lokman Ahmed		**e-mail**	mohandaldabag@ntu.edu.iq	
Module Leader's Acad. Title	Asst.Prof.		**Module Leader's Qualification**	PhD.	
Module Tutor	None		**e-mail**	None	

Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	21/09/2024	**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 Objectives أهداف المادة الدراسية	• Understanding the basic concepts of Data structures such as arrays, stacks, queues, trees, graphs, and so on. for building blocks of algorithms and programs.. • Analyzing the algorithms that are used to manipulate data. By analyzing algorithms, we can determine their efficiency and optimize them to make them faster and more efficient. • Choosing the right data structure is essential for developing efficient programs. The study of data structures helps in choosing the right data structure for a particular problem. • The study of data structures helps in implementing data structures such as linked lists, trees, and graphs. By implementing data structures, we can create efficient programs that can handle large amounts of data.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Understanding the fundamental concepts of data structures. • Analyzing the performance of algorithms • Choosing appropriate data structures. • Implementing data structures. • Designing algorithms. • Applying data structures to real-world problems
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Part A – Introduction to data structures: Overview of data structures, their types, and applications. .[8 hrs] • Part B- Arrays and Linked lists:: One-dimensional and multi-dimensional arrays, array operations, and applications. Linked lists: Singly linked lists, doubly linked lists, circular linked lists, and their operations.[12hrs] • Part C -: Stacks and Queues Array-based and linked-list based implementation of stacks and queues, their operations, and applications.. [12 hrs] • Part D - Trees: Binary trees, binary search trees, AVL trees, red-black trees, and their operations. [14 hrs] • Part E – Graphs: Graph representation, graph traversal algorithms, shortest path algorithms, and minimum spanning tree algorithms..[10 hrs] • Revision problem classes [4 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be used in Data structure courses to introduce the concepts of data structures and explain the theoretical aspects of algorithms that operate on data structures,provide hands-on exercises to help students implement data structures and algorithms using programming languages such as C++, Java, or Python, provide practice problems to help students improve their problem-solving skills and prepare for exams and assess students' understanding of data structures and algorithms through quizzes, exams, programming assignments, and group projects..

Student Workload (SWL)

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

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	8	10% (10)	5, 10	LO #1, 2, 6,7,8,9,10 and 11
	Assignments	8	10% (10)	2, 12	LO # 3, 4, 6, 7,9,10,12,14
	Projects / Lab.	16	10% (10)	Continuous	All
	Report	5	10% (10)	2,4,8 ,10and13	LO#2,4,8,10 and 13
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	General introduction to data structures: Introduce to the Basic types of Data Structures and the common algorithm
Week 2	Linear data structures: What is linear data structure, characteristics of linear data structure and types of linear data structure
Week 3	Algorithm Analysis: Algorithm Analysis types and methods,experimental of analysis algorithm
Week 4	Recursion: Introduction to recursion, some problems that solved by recursion and the difference between recursion and iteration
Week 5	Back tracking technique: Introduction to back tracking technique ,general method of back tracking technique ,when to use a Backtracking algorithm and How does Backtracking work.
Week 6	Linked Lists: Introduction linked lists data structures ,comparison between linked lists and array .
Week 7	Linked Lists: basic operations on linked lists(Insertion, Deletion and traversing).
Week 8	Types of linked lists: Doubly linked lists,circular linked lists,memory -efficient doubly linked list,unrolled linked lists
Week 9	Stacks: What is a Stack,how stacks are used and stack applications and implementations.
Week 10	Queue: What is queue ,how are queues used and queue exceptions and implementations
Week 11	Tree : What is tree,binary trees and types of binary trees and properties of binary trees.
Week 12	Tree: Binary tree traverals,generic trees(N-ary trees) and threaded binary tree traversals
Week 13	Sorting algorith: What is sorting ,why is sorting necessary and classification of sorting algorithms.
Week 14	Sorting algorith: Classification of sorting algorithm types:bubble sort, selection sort, insertion sort,shell sort,merge sort

	,quick sort and tree sort.
Week 15	Review
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: function declaration and function expression
Week 2	Lab 2: pointer declaration and initialization.
Week 3	Lab 3:user defined data structures
Week 4	Lab 4: Implementation problems using iteration/recursion problems
Week 5	Lab 5: implementation of back tracking method
Week 6	Lab 6:how to define a linked list node and programming traversal operation.
Week 7	Lab 7:programming a linked list insertion operation.
Week 8	Lab 8: programming a linked list deletion operation.
Week 9	Lab 9: Implementation of push and pop operation on stack
Week 10	Lab 10: Programming some application using stack.
Week 11	Lab11: Programming the queue to store some of data
Week 12	Lab 12: Programming a storing data as tree structure and implementation of various traversal techniques
Week 13	Lab 13: Programming a storing data as graph structure and implementation of various traversal technique
Week 14	Lab 14: Programming a bubble sort, selection sort and insertion sort algorithms
Week 15	Lab 15: Programming a shell sort,merge sort ,quick sort and tree sort algorithms
Week 16	Final Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	1- Data Structures And Algorithms Made Easy by Narasimha Karumanch (Author)	YES
Recommended Texts	data structure, algorithm and application in c++ by Sartaj sahni	No
Websites	https://opendatastructures.org/	

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
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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
Northern Technical University
Engineering Technical College/Mosul
Department of Computer Techniques Engineering

Module Descriptor Form
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	**Measurements & Sensors**	**Module Delivery**	
Module Type	Core	✓ **Theory** ✓ **Lecture** ✓ **Lab** **Tutorial** **Practical** ✓ **Seminar**	
Module Code	CTE205		
ECTS Credits	2		
SWL (hr/sem)	**50**		
Module Level	**2**	**Semester of Delivery**	1
Administering Department	**Department of Computer Techniques Engineering**	**College**	**Northern Technical University Engineering Technical College of Computer and Artificial Intelligence/Mosul**
Module Leader	Ahmed Waled Kasim	**e-mail**	ahmadwaled1973@ntu.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	12/09/2024	**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 Objectives أهداف المادة الدراسية	• Explain the basic working principle of various electronic measurement instruments used to measure electrical parameters like current, voltage, power etc. • Understand and describe the specifications, features, characteristics, error and the performance of an instrument. • Learn about various types AC bridges and their applications in measurements of

	capacitance, frequency, inductance etc. • Gain knowledge about the functional blocks of a CRO and do analysis, measurements of waveform display. • Explain working of various types of sensors, transducers and their applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	After the completion of course, the students will have ability to: 49. Learning about the principle of various electronic measurement instruments. 50. Ability to design the AVO-meter instrument from PMMC. 51. Learning about the both types of electrical bridges (DC and AC) bridges. 52. Learning the main principles of Oscilloscopes instruments. 53. 5. Learning the main principles of the electrical sensors, transducers and taking some examples about them.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Part A – Measurement & Errors: Definitions, significant figures, some examples, Types of Errors, Statistical Analysis with applications examples [2 hrs]. • Part B- Electromechanical Indicting Instruments: The DC Ammeters and DC Voltmeters, Properties of DC Voltmeters and Series type Ohmmeter, Alternating - Current Indicating Instruments, Thermo-instruments(Thermocouple Instrument), Electrodynamometer and their application [6 hrs] • Part C Bridges and their Applications: DC and AC Bridges with some examples [4 hrs] • Part D Oscilloscopes; [2 hrs] • Part E Hall Effect Sensors: Types of Hall Effect Sensors, Some Examples about Hall Effect Sensors [4 hrs] • Part F Signal Generation: [2 hrs] • Part G Analogue and Digital Data Acquisition System: [2 hrs] • Part H Computer – Controlled Test Syste: [2 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

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

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	29	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	21	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	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	4	10% (10)	5, 8,11,14	LO #1, 2, 10 and 11
	Assignments	6	10% (10)	2, 3,4,5,7,10	LO # 3, 4, 6 and 7
	Projects / Lab.	15	10% (10)	Continuous	All
	Report				
Summative assessment	Midterm Exam	2 hr	20% (20)	9	LO # 1-9
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Measurement and Errors.
Week 2	Electromechanical Indicting Instruments.
Week 3	Electromechanical Indicting Instruments.
Week 4	Electromechanical Indicting Instruments.
Week 5	Bridges and their Applications.
Week 6	Bridges and their Applications.
Week 7	Oscilloscopes.
Week 8	1-Theory of Hall Effect, Hall Effect Sensors, Basic Hall Effect Sensors. 2-Analogue output Sensors.
Week 9	Mid-Term Exam.
Week 10	1- Digital output Sensors. 2- Some Examples about Hall Effect Sensors.
Week 11	Signal Generation.
Week 12	Analogue and Digital Data Acquisition System.
Week 13	Computer – Controlled Test System.
Week 14	Preparatory Week.
Week 15	Final Exam

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab1: Measurements of DC current.
Week 2	Lab2: Measurements of DC voltage.
Week 3	Lab 3: Loading effect on Voltmeter.
Week 4	Lab 4: Series type Ohmmeter.
Week 5	Lab 5: AC Voltmeter using half wave rectifier.
Week 6	Lab 6: AC Voltmeter using full wave rectifier.
Week 7	Lab 7: DC Bridges (Wheatstone bridge).
Week 8	Lab 8: Comparison bridges.
Week 9	Lab 9: Maxwell and Hay bridges.
Week 10	Lab 10: Measurements of frequency.
Week 11	Lab 11: Measurements of phase angle using Lissajous method.
Week 12	Lab 12: Calibration of Thermocouple.
Week 13	Lab 13: Photosensitive.
Week 14	Lab 14: Review.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Electronic Instrumentation and Measurement Techniques by: W. D. Cooper and A. D. Helfrick. 3rd edition.	Yes
Recommended Texts	Principles of Measurement Systems" by John P. Bentley	No
Websites	Measurement systems: Application and design 4th Revised edition by Ernest O. Doebelin https://www.amazon.com/Measurement-Systems-Application-Design-Doebelin/dp/0070173389	

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.

Ministry of Higher Education and
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Engineering Technical College/Mosul
Department of Computer Techniques Engineering

Module Descriptor Form

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	**Computer architecture**	**Module Delivery**	
Module Type	Core	✓ **Theory** ✓ **Lecture** ✓ **Lab** ✓ **Tutorial** ✓ **Practical** ✓ **Seminar**	
Module Code	CTE206		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	**Semester of Delivery**	2
Administering Department	**Department of Computer Techniques Engineering**	**College**	**Northern Technical University Engineering Technical College of Computer and Artificial Intelligence/Mosul**
Module Leader	Ahmad F. Al-Allaf	**e-mail**	Ahmed.faleh@atu.edu.iq
Module Leader's Acad. Title	Assistant Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	13/09/2024	**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 Objectives أهداف المادة الدراسية	30. Microprocessor Interfacing: Students learn about interfacing microprocessors with external devices such as memory, input/output ports, and peripherals.. 31. Memory Systems: The course cover different memory types used in microprocessor systems, such as main memory, and secondary storage, types of semiconductor memories (ROMs and RAMs). 32. Interrupts: Students learn about interrupt handling mechanisms in 8086 microprocessors. This includes understanding interrupt prioritization, interrupt service routines, and designing hardware interrupt circuits.
Module Learning Outcomes مخرجات التعلم للمادة	54. Explain the principles and characteristics of different memory types used in microprocessor systems, including, main memory, secondary storage. 55. Design and implement interfaces between a microprocessor (16 and 32 bit) and external devices, such as memory, input/output ports, and peripherals, applying

الدراسية	relevant protocols and techniques. 56. Interfacing different I/O deceives to the 8088 and 8086 microprocessors, such as Keyboard, &-segment displays, and ADC/DAC circuits. 57. Understand the concepts and mechanisms of interrupts in microprocessors, including interrupt prioritization, and interrupt service routines. 58. Designing hardware interrupt circuits.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • **Part-A: Basic computer architecture and memory:** Computer organization, Primary and secondary memories, Memory hierarchy, types of ROMs and RAMs, primary memory architecture, Internal structure and operation of ROMs, and RAMs [8hrs.] • **Part-B: Memory Interfacing:** Memory address decoder, Simple address decode, 2-4 and 3-8 address decoders. Use programmable logic devices (PLDs) to decode memory addresses, Interfacing ROM and SRAM to the 8088 microprocessor, Expanding memory in size and words. Interfacing ROM and SRAM to the 8086 microprocessor, Interfacing ROM and SRAM to the 32-bit microprocessor, memory interfacing Design examples [20hrs] • **Part-C: I/O interfacing:** The I/O Instructions, Isolated and Memory-Mapped I/O, Basic Input and Output Interfaces, Interfacing simple devices (LEDs and switches) to the 8088/8086 microprocessor, Interfacing ADC and DAC to the 8088/8086 microprocessor, Interfacing Keyboard and 7-segment displays to the 8088/8086 microprocessor [20hrs] • **Part -D : Interrupts:** Basic Interrupt Processing, Interrupt Instructions, Interrupt Vector, Hardware Interrupts, Expanding the Interrupt Structure, Using the 74ALS244 to Expand Interrupts, Daisy-Chained Interrupt, Interrupt Examples, Real-Time Clock, Interrupt-Processed Keyboard. [12hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

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

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	61	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	89	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	10% (10)	6, 10	LO #1, 2, 10 and 11
	Assignments	8	10% (10)	4, 7,10,13	LO # 3, 4, 6 and 7
	Projects / Lab.	15	10% (10)	Continuous	All
	Report	5	10% (10)	3, 6,9,12	LO # 3,6, 9 and 12
Summative	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7

assessment	**Final Exam**	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	• Basic computer architecture: Computer organization, Primary and secondary memories, Memory hierarchy, types of ROMs and RAMs
Week 2	• Primary memory architecture: Internal structure and operation of ROMs, and RAMs
Week 3	• Memory address decoder: Simple address decode, 2-4 and 3-8 address decoders. Use programmable logic devices (PLDs) to decode memory addresses.
Week 4	• Memory interfacing: Interfacing ROM and SRAM to the 8088 microprocessor, Expanding memory in size and words.
Week 5	Memory interfacing: Interfacing ROM and SRAM to the 8086 microprocessor.
Week 6	• Memory interfacing: Interfacing ROM and SRAM to the 32-bit microprocessor.
Week 7	• Memory Interfacing: Memory interfacing Design examples
Week 8	• I/O system: The I/O Instructions, Isolated and Memory-Mapped I/O, Basic Input and Output Interfaces
Week 9	• I/O system interfacing: Interfacing simple devices (LEDs and switches) to the 8088/8086 microprocessor
Week 10	• I/O system interfacing: Interfacing ADC and DAC to the 8088/8086 microprocessor,
Week 11	• I/O system interfacing Interfacing Keyboard and 7-segment displays to the 8088/8086 microprocessor
Week 12	• Interrupts: Basic Interrupt Processing, Interrupt Instructions, Interrupt Vector, Hardware Interrupts.
Week 13	• Interrupts: Expanding the Interrupt Structure, Using the 74ALS244 to Expand Interrupts, Daisy-Chained Interrupt.
Week 14	• Interrupts: Interrupt Examples, Real-Time Clock, Interrupt-Processed Keyboard
Week 15	• **Final Exam.**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Proteus simulator for digital systems
Week 2	Lab 2: Introduction to Memory type and organization
Week 3	Lab 3: Address decoders
Week 4	Lab 4: SRAM interfacing
Week 5	Lab 5: ROM interfacing
Week 6	Lab 6: Expanding ROM and RAM
Week 7	Lab 7: Interfacing LEDs and switches to the microprocessor
Week 8	Lab 8: Interfacing Keyboard to the microprocessor
Week 9	Lab 9: Interfacing 7-segment display to the microprocessor

Week 10	Lab 10: Interfacing ADC to the microprocessor
Week 11	Lab 11: Interfacing DAC to the microprocessor
Week 12	Lab 12: Expanding the Interrupt Structure using the 74ALS244
Week 13	Lab 13: Interrupt design example
Week 14	Lab 14: Review

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	The Intel Microprocessors (8th Edition), BARRY B. BREY, 2009	No
Recommended Texts	MICROPROCESSOR 8086 Architecture, Programming and Interfacing, **Sunil Mathur, 2011**	No
Websites	https://www.coursera.org https://www.edx.org https://ocw.mit.edu	

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.

Ministry of Higher Education and
Scientific Research - Iraq
Northern Technical University
Engineering Technical College/Mosul
Department of Computer Technology Engineering

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	Electronic Circuits	**Module Delivery**	
Module Type	Core	✓ **Theory** ✓ **Lecture** ✓ **Lab** ✓ **Tutorial** ✓ **Practical** ✓ **Seminar**	
Module Code	CTE207		
ECTS Credits	6		
SWL (hr/sem)	125		

Module Level		**Semester of Delivery**	1
Administering Department	**COMPUTER TECHNIQUES ENGINEERING**	**College**	Northern Technical University Engineering Technical College of Computer and Artificial Intelligence /Mosul
Module Leader	Thabat F. Thabet	**e-mail**	Thabet.tfy@ntu.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	PhD.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	10/09/2024	**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	33. To learn the applications of BJT . 34. Study the types of BJT amplifiers (Common Emitter, Common Collector, and Common Base). 35. Study the Frequency response of amplifiers. 36. Differential and Operational Amplifiers 37. Negative Feed-back (Inverting and Non-inverting Amplifiers) and other Applications of Operational Amplifiers. 38. Study the family of Field Effect Transistors (FET).
Module Learning Outcomes	59. Learning about the BJT applications. 60. Learning about the types of BJT amplifiers.

مخرجات التعلم للمادة الدراسية	61. Frequency Response 62. Learning about Differential and Operational Amplifiers 63. Study the family of Field Effect Transistors (FET)..
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Part A – **BJT Applications** BJT as a Switch (cutoff and saturation). Linear operation and DC load line [8 hrs] • Part B- **BJT Amplifiers.** Common Emitter CE. Common Collector CC. Common Base CB. [12 hrs] • Part C **Frequency Response** The Decibel. Low Frequency Amplifier Response (Effect of the external capacitors). High Frequency Amplifier Response (Effect of the internal capacitors). Total Frequency Response (Bode Plot). [16 hrs] • Part D **Differential and Operational Amplifiers** Differential and Operational Amplifiers. Negative Feed-back (Inverting and Non-inverting Amplifiers). Applications of Operational Amplifiers. [12 hrs] • Part E **Field Effect Transistors (FET).** Junction Field Effect Transistors (JFET). Metal Oxide Semiconductor Field Effect Transistors (MOSFET). [8 hrs] • Revision problem classes [4 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

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

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	61	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	89	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	10% (10)	4, 7, 9, 13	LO # 1, 2, 4 and 5
	Assignments	8	10% (10)	3, 4, 7, 9, 14	LO # 1, 2, 4, 5 and 6
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	5	10% (10)	3, 7, 8, 11, 13	LO # 2, 3, 4, 5 and 6
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	BJT as a Switch (cutoff and saturation).
Week 2	Linear operation and DC load line.
Week 3	Common Emitter CE.
Week 4	Common Collector CC.
Week 5	Common Base CB.
Week 6	The Decibel.
Week 7	Low Frequency Amplifier Response (Effect of the external capacitors)
Week 8	High Frequency Amplifier Response (Effect of the internal capacitors)
Week 9	Total Frequency Response (Bode Plot)
Week 10	Differential and Operational Amplifiers.
Week 11	Negative Feed-back (Inverting and Non-inverting Amplifiers).
Week 12	Applications of Operational Amplifiers.
Week 13	Junction Field Effect Transistors (JFET).
Week 14	Metal Oxide Semiconductor Field Effect Transistors (MOSFET).
Week 15	Preparatory Week
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Review of Transistor Biasing (operating point)
Week 2	Lab 2: BJT as a Switch (cutoff and saturation).
Week 3	Lab 3: Linear operation and DC load line.
Week 4	Lab 4: Common Emitter Amplifiers
Week 5	Lab 5: Common Collector Amplifiers
Week 6	Lab 6: Common Base Amplifiers
Week 7	Lab 7: Frequency response of OPAMP
Week 8	Lab 8: Inverting and Non-inverting OPAMPs
Week 9	Lab 9: Analogue Comparator
Week 10	Lab 10: The Integrator Circuit
Week 11	Lab 11: The Differentiator Circuit
Week 12	Lab 12: FET
Week 13	Lab 13: FET Amplifier
Week 14	Lab 14: Review

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Thomas L. Floyd, Electronic Devices, 9th Edition, Pearson Education 2012	Yes
Recommended Texts	R. BOYLESTAD and L. NASHELSKY, "ELECTRONIC DEVICES AND CIRCUIT THEORY", 11th edition, Pearson Education , 2013	Yes
Websites	Digital Systems: From Logic Gates to Processors: https://www.coursera.org/learn/electronics	

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.

Ministry of Higher Education and Scientific Research - Iraq
Northern Technical University
Engineering Technical College/Mosul
Department of Computer Techniques Engineering

Module Descriptor Form

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Computer applications	**Module Delivery**	
Module Type	Core	✓ **Theory** ✓ **Lecture** ✓ **Lab** ✓ **Tutorial** ✓ **Practical** ✓ **Seminar**	
Module Code	CTE209		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	2	**Semester of Delivery**	1
Administering Department	**Department of Computer Techniques Engineering**	**College**	**Northern Technical University Engineering Technical College of Computer and Artificial Intelligence/Mosul**
Module Leader	Shaima Miqdad Mohamed Najeeb	**e-mail**	shaimamiqdad76@ntu.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	21/09/2024	**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 Objectives أهداف المادة الدراسية	39. provide a foundation in programming for engineering problem solving using the MATLAB software package. 40. develop the skills analyze and break down a program and solve it . 41. study the creation and use of functions and scripts in MATLAB. 42. study the use of MATLAB for data analysis and visualization, including plotting functions. 43. Learn the capabilities and applications supported by the MATLAB program, implement them, and use them to solve various problems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	64. Ability to use MATLAB: Students should be able to use the MATLAB software effectively, including navigating the MATLAB desktop, using the command window, and accessing the help system. 65. Ability to create scripts and functions: Students should be able to create and use MATLAB scripts and functions to solve problems and automate tasks. 66. Ability to perform data analysis and visualization: Students should be able to use MATLAB's built-in functions and tools for data analysis and visualization 67. Ability to perform simulations and modeling: Students should be able to use MATLAB for simulations and modeling of systems. 68. Ability to perform Graphical User Interfaces(GUI) and apply to construct the front end for different applicatio
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Part A – Introduction to MATLAB and Data Structures Overview of MATLAB environment, history, and applications. Basic commands, arrays, matrices, vectors, and cell arrays. scripts, functions and File I/O and Data Manipulation: Importing and exporting data from files, data cleaning, and manipulation.[10 hrs] • Part B- Numeric Data Types and Basic Operations: Numeric data types, arithmetic operations, and mathematical functions.[4 hrs] • Part C - Control Structures: Conditional statements, loops, and logical operators. [10 hrs] • Part D -Plotting and Visualization: Creating plots, customizing plots, and 2D/3D visualization. [6 hrs] • Part E – Simulink and GUI Simulink consept, creating models, and simulation. Graphical User Interfaces(GUI) construct the front end for different applicatio.[10 hrs] • Revision problem classes [3 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be used in MATLAB courses to introduce concepts, explain syntax and functions, and provide examples. Hands-on exercises are an effective learning strategy in MATLAB courses to help students apply what they have learned. Exercises may involve solving problems, writing functions, and working with data. Case studies are a useful teaching strategy in MATLAB courses to help students understand how MATLAB can be used in real-world applications. Overall, the learning and teaching strategies of a MATLAB course should be designed to maximize students' understanding and proficiency in using MATLAB for various applications in engineering, science, and other fields.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	45	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	55	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
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)	5, 10	LO #1, 2, 10 and 11
	Assignments	5	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	15	10% (10)	Continuous	All
	Report	2	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	General introduction to matlab programming: Introduce to the basics of programming in general and programming MATLAB® in particular.Environment and Settings,Preferences and settings, platform differences, adding hardware and optional features
Week 2	Programming in MATLAB: Introduction to matrices and vectors , creating a Matlab Matrix, referencing the Elements of a Matrix, deleting a Row or a Column in a Matrix.
Week 3	Programming in MATLAB: Arithmetic ,logical and bitwise operations.
Week 4	Programming IN MATLAB: Writing MATLAB scripts and functions, a custom-made Matlab functions.
Week 5	Programming in MATLAB : Loops and control flow (for-loops, if-statements)
Week 6	Function in MATLAB : Declare function name, inputs, and outputs(syntax) with examples.
Week 7	Plotting in matlab: Overview of MATLAB Plotting, Plotting Process graph components,figure tools,selecting plot types
Week 8	Plotting in matlab: Basic Plotting (Multiple Data Sets in One Graph, Specifying Line Styles and Colors, Multiple Plots in One Figure, Setting Axis Limits).
Week 9	Plotting in matlab: Mesh and surface plots, visualizing functions of two variables .
Week 10	Plotting in matlab: Handle graphics: Work with graphics objects and set object properties. Animations: Create moving graphics
Week 11	Matlab simulink: Simulink Concepts, simulink environment,basic elements,simulink librarys
Week 12	Matlab simulink: Block Libraries,modifying the blocks ,interactive model editing,programmatic model editing and running simulation .
Week 13	MATLAB GUI: Creating Graphical User Interfaces, introduces GUIDE, the MATLAB graphical user interface design environment, Laying out a GUI,

Week 14	3D Computer Graphics Operations: Programming a GUI, introduces callbacks to define behavior of the GUI components, Menu-driven programs, Controls: uimenu and uicontrol.
Week 15	Final Exam.

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to MATLAB .
Week 2	Lab 2: Basic commands
Week 3	Lab 3: Working with matrices part(I)
Week 4	Lab 4: Working with matrices part(II)
Week 5	Lab 5: Relational ,logical bitwise operations
Week 6	Lab 6: Input and output commands in a script file.
Week 7	Lab 7: Flow control(if and switch-case) statements
Week 8	Lab 8: Loop(for,while,break,continue)statements
Week 9	Lab 9: M-file functions
Week 10	Lab 10: 2D Plotting functions
Week 11	Lab 11: 3D Plotting functions
Week 12	Lab 12: Basics of Matlab simulink
Week 13	Lab 13:Graphical user interface part(I)
Week 14	Lab 14: Graphical user interface part(II)

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	1-MATLAB for Engineering Applications 4th Edition by William Palm Iii (Author)	Yes
Recommended Texts	Getting Started with MATLAB® Version 7 by Mathwoks	No
Websites	Digital Systems: From Logic Gates to Processors: https://www.coursera.org/learn/matlab	

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.

Ministry of Higher Education and Scientific Research - Iraq
Northern Technical University
Engineering Technical College/Mosul
Department of Computer Techniques Engineering

Module Descriptor Form

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Communication Fundamentals	**Module Delivery**	
Module Type	Core	✓ **Theory** ✓ **Lecture** ✓ **Lab** ✓ **Tutorial** ✓ **Practical** ✓ **Seminar**	
Module Code	CTE208		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	2	**Semester of Delivery**	2
Administering Department	**Department of Computer Techniques Engineering**	**College**	**Northern Technical University Engineering Technical College of Computer and Artificial Intelligence/Mosul**
Module Leader	Dr. Emad A. Mohammed	**e-mail**	e.a.mohammed@ntu.edu.iq
Module Leader's Acad. Title	Asst. prof.	**Module Leader's Qualification**	PhD
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	21/09/2024	**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 Objectives أهداف المادة الدراسية	44. To learn the fundamentals of communications system architecture. 45. To learn the basic components used in communication system and each component basic functions. 46. To learn the types of channels that are used in communication system. 47. To learn the basic techniques used in signal representation, modulation and demodulation. 48. To learn the basics of transmission lines, their use and their equivalent circuits
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	69. To learn how to deal with different types of signals. 70. To learn how to utilize linear and nonlinear systems. 71. To learn how to design different types of filters. 72. To learn the basics of finding the spectrum of different types of signals. 73. To be familiar with various types of modulation. 74. To be familiar with how to use smith chart for transmission lines.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Part A – Signals and Systems Signals and system definition, periodic signals, non-periodic signal, deterministic and non-deterministic signals Linear systems and nonlinear systems, filters, [8 hrs] • Part B- Fourier Series and Transform Fourier series, signal harmonics, Fourier transform, Frequency domain, exponential and trigonometric Fourier transform, Properties of Fourier Transform, application of Fourier transform [12 hrs] • Part C -Signals Transmission Baseband signal transmission, line coding, polar code, bipolar code, Manchester code, Analogue modulation Techniques, AM, FM, PM, Pulse modulation techniques, PAM, PPM, PWM [12 hrs] • PartD- Digital Modulation and Digital Channels. Digital modulation Techniques ASK, PSK, FSK, Multilevel modulation, QAM, Wireless channels, Shannon equation, channel capacity [12 hrs] • PartE-Transmission lines. Transmission lines and their equivalent circuits, TL characteristics, Incident wave, reflected wave, Smith Chart, matching techniques [10 hrs} • Revision problem classes [6 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

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

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	101	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	8	10% (10)	4,6,10,12	LO #1, 2, 10 and 11
	Assignments	8	10% (10)	2, 5,8,11	LO # 3, 4, 6 and 7
	Projects / Lab.	15	10% (10)	Continuous	All
	Report	8	10% (10)	1,3,9,13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Signals and system definition, periodic signals, non-periodic signal, deterministic and non-deterministic signals
Week 2	Linear systems and nonlinear systems, filters
Week 3	Fourier series, signal harmonics
Week 4	Fourier transform, Frequency domain, exponential and trigonometric Fourier transform
Week 5	Properties of Fourier Transform, application of Fourier transform
Week 6	Baseband signal transmission, line coding, polar code, bipolar code, Manchester code
Week 7	Analogue modulation Techniques, AM, FM, PM
Week 8	Pulse modulation techniques, PAM, PPM, PWM
Week 9	Digital modulation Techniques ASK, PSK, FSK
Week 10	Multilevel modulation, QAM
Week 11	Wireless channels, Shannon equation, channel capacity
Week 12	Transmission lines and their equivalent circuits, TL characteristics
Week 13	Incident wave, reflected wave
Week 14	Smith Chart, matching techniques
Week 15	Final Exam.

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Signals properties
Week 2	Lab 2: Linear systems and nonlinear systems, filters
Week 3	Lab 3: Harmonics determination
Week 4	Lab 4: Fourier transform, Spectrum analysis
Week 5	Lab 5: Fourier transform properties
Week 6	Lab 6: Types of Baseband signals
Week 7	Lab 7: Amplitude and phase modulation
Week 8	Lab 8: Frequency modulation
Week 9	Lab 9: PPM, PAM, PWM
Week 10	Lab 10: ASK
Week 11	Lab 11: FSK
Week 12	Lab 12: PSK
Week 13	Lab 13: QAM
Week 14	Lab 14: Review

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Ferrel Stremler " Introduction to Communication Systems" Addison Wesley Longman, 3rd Edition 1992	Yes
Recommended Texts	B.P. Lathi "Modern Digital and Analog Communication Systems" Oxford University Press, 4th Edition, 2010	No
Websites	Communication Skills Courses & Tutorials Online https://www.udemy.com	

APPENDIX:

GRADING SCHEME
مخطط الدرجات

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

Note:

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Engineering Technical College/Mosul
Department of Computer Techniques Engineering

Module Descriptor Form

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Website Design	**Module Delivery**	
Module Type	Core	✓ **Theory** ✓ **Lecture** ✓ **Lab** x **Tutorial** ✓ **Practical** ✓ **Seminar**	
Module Code	CTE210		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	2	**Semester of Delivery**	2
Administering Department	**Department of Computer Techniques Engineering**	**College**	**Northern Technical University Engineering Technical College of Computer and Artificial Intelligence/Mosul**
Module Leader	Nawar Ali Ibrahim Al_Obaidy	**e-mail**	Nawar.ali@ntu.edu.iq
Module Leader's Acad. Title	Assist Lecturer	**Module Leader's Qualification**	PhD.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	21/09/2024	**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 Objectives أهداف المادة الدراسية	The objectives of a course on Website Design: Upon successful completion of the Diploma, students should be able to: 1. Developing front-end website architecture 2. Designing user interactions on web pages 3. Developing back-end website applications 4. Creating servers and databases for functionality 5. Developing adaptive content for multiple devices (cell phones, tablets, etc.) ensure cross-platform optimization for mobile phones 6. Ensure responsiveness of applications 7. Working alongside graphic designers for web design features 8. Managing a project from conception to finished product 9. Designing and developing Application Programming Interfaces (APIs) 10. Meeting both technical and consumer needs for a web development project 11. Learning to research new methods of development in web applications and programming languages 12. Preparing mock-ups and storyboards for a web development project. 13. Consult with clients to develop and document website requirements.

	14. Demonstrating communication skills, service management skills, and presentation skills. 15. Completing job preparation tasks including writing resumes and cover letters, conducting job interviews, and developing an ePortfolio
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon successful completion of the **Certificate**, graduates should be able to: • Use their learned skills, knowledge, and abilities to develop websites for the internet • Apply basic design principles to present ideas, information, products, and services on websites • Apply fundamental programming principles to the construction of websites • Effectively manage website projects using available resources • Demonstrate communication skills, service management skills, and presentation skills • Complete job preparation tasks including writing resumes and cover letters, conducting job interviews, and developing an ePortfolio • Apply employability skills including fundamental skills, personal management skills, and teamwork skills
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • **Part A** – Introduction to Website Building: Provide a historical review of web design and the stages it went through in the process of development. Learning the basics of web design and development [4 hrs.] • **Part B**- The Website and Its Future: Explaining how website design can provide students with great opportunities in many jobs. In addition to increasing the demand for web designers in the future because companies are in constant need of competencies in the field of web work to provide them with all means of technical support for websites because the website is the first interface for companies and institutions. [2 hrs.] • **Part C** -: The Language of the Web: HTML5: present the design of a web page by referring to the HTML5 semantic tags and using some CSS3 style properties. learning a simple structure of a web page with its associated style sheet. [8 hrs.] • **Part D** - Structuring the content of a web page: It covers the following concepts: ○ Structuring an HTML page (head/body/header/nav/main/article/aside/footer); ○ Importing elements (font/icons/style sheet/conditional import); ○ Organizing the elements of an HTML page (container/header/menu/sidebar/footer); ○ Adding style properties to these elements. [6 hrs.] • **Part E** – Style Sheets: CSS3: CSS – Cascading Style Sheets – is commonly used to format HTML-type web pages using display properties (colors, fonts, borders, etc.) and positioning properties (height, width, top-down, side-by-side, etc.). The display result of a web page can be completely changed without adding additional code to the web page. [6 hrs.] • **Part F** – Design and Creation a Website: The purpose is: ○ Avoid repeating the same formatting code in each web page; ○ Employ common styles, using clear names (e.g. employing the same shaded style for images or text); ○ Modify the appearance of an entire website by changing only one single file (the style sheet). [4 hrs.] • – understand the code of the web page. [4 hrs.]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	Following planned steps to teach students the basic skills that they must learn (in the correct order) as follow: **Getting Started**: Fundamentals of Web Design and Development **Learn Essential Skills**: Design and programming concepts that all new web designers should learn.

	Using the Best Resources: A complete list of the best resources for learning web design. **Gain Experience**: How to gain hands-on web design experience and build your portfolio. **Choosing a Career Path**: Decide if freelancing or working at home is right for them. **Finding a job**: How to find their first web design job and start their career.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	43	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	32	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
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**	3	10% (10)	4, 6, 8, 10, 12, 14	LO # 2, 3, 8, 9, 10 and 11
	Assignments	4	10% (10)	2, 5, 8, 12	LO # 1-2, 4-5, 7, 11
	Projects / Lab.	16	10% (10)	Continuous	All
	Report	6	10% (10)	3, 6-8,10-12	LO#2,4and10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-6
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Background and Phases of Evolution of the Web.
Week 2	Web application architecture.
Week 3	Choosing a Domain Name and Hosting
Week 4	Installing WordPress and Account Setup
Week 5	WordPress Admin Dashboard and the Features
Week 6	Structure of an HTML5 document.
Week 7	CSS3 Overview.
Week 8	Process of creating a website.
Week 9	Different website types and ergonomics the website
Week 10	New Theme Installation
Week 11	Header and Landing Page Top Design
Week 12	How to Insert Logo, Site Title, and Setup Search Box on a Website
Week 13	Explanation of Post Screen Option and its Use
Week 14	Footer Design of a Website and Adding Social Media Link
Week 15	Final Exam

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Step-by-Step Guide to Registering Domain Name.
Week 2	Lab 2: Structure of an HTML5 web page.
Week 3	Lab 3: How to Design the Menu Items.
Week 4	Lab 4: Simple Forms and Table Formatting.

Week 5	Lab 5: How to Add Search on the Website.
Week 6	Lab 6: How to Change Website Title and Description
Week 7	Lab 7: Steps in Adding Gallery to a Website using Gallery Widget Option.
Week 8	Lab 8: How to Place Slider on the Website.
Week 9	Lab 9: How to Publish with Post Tool.
Week 10	Lab 10: How to insert Page Break (Block) in a Post.
Week 11	Lab 11: How to Hyperlink in a Post.
Week 12	Lab 12: Inserting Image/Photo in the Post or Pages.
Week 13	Lab 13: Creating a template model.
Week 14	Lab 14: Creating a website from A to Z.
Week 15	Final Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Website Design and Development with HTML5 and CSS3. Authers: Hassen Ben Rebah, Hafedh Boukthir, and Antoine Chédebois	No
Recommended Texts	How to Build and Design a Website using wordpress, William S. Page, 2020	No
Websites		

APPENDIX:

GRADING SCHEME
مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
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Module Descriptor Form

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	**Summer Training 1**	**Module Delivery**	
Module Type	Suplement	**Theory**	
Module Code	CTE211	**Lecture**	
ECTS Credits	2	✓ **Lab**	
SWL (hr/sem)	50	**Tutorial**	
		✓ **Practical**	
		✓ **Seminar**	

Module Level	2	**Semester of Delivery**	2
Administering Department	**Department of Computer Techniques Engineering**	**College**	**Northern Technical University Engineering Technical College of Computer and Artificial Intelligence/Mosul**
Module Leader	All Acadimic staf	**e-mail**	
Module Leader's Acad. Title		**Module Leader's Qualification**	
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	21/09/2024	**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 Objectives أهداف المادة الدراسية	1- القدرة على ربط المعرفة المكتسبة من الطالب خلال دراسته االاكاديمية بالمشاكل الحقيقة على ارض الواقع 2- اكتشاف بيئة العمل واحتياجاتها وقيودها 3- القدرة على تحديد المتطلبات المطلوبة لايجاد حلول مناسبة وفعالة للمشاكل الحقيقية على ارض الواقع مع وجود قيود فنية مختلفة 4- القدرة على تكوين رؤية واضحة حول الاهداف والمعوقات والعمل بشكل فعال 5- ايجاد الطالب استقالاليته باكتسابه لمهارات جديدة مع اشراف بسيط من قبل جهة التدريب . 6- القدرة على ايجاد حلول مناسبة في حال حدوث اي تغيير في متطلبات العمل وقيوده 7- القدرة على التواصل مع الكثير من االشخاص المتواجدين في المجال العملي . 8- تعلم المسؤوليات الاخلاقية والاحترافية.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Understanding of Computer Architecture: Gain knowledge of the components and operation of computer systems, including processors, memory, input/output devices, and the organization of data. • Programming Skills: Develop proficiency in programming languages commonly used in computer engineering, such as C, C++, Java, or Python. Learn to write efficient and well-structured code. • Problem-Solving and Algorithm Design: Learn techniques for problem-solving and algorithm development. Understand various algorithmic approaches and their efficiency. Develop skills to

	analyze and optimize algorithms.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Part 1– [7 hrs] : تعريف الطالب على اقسام وشعب الموقع التدريبي • Part 2- [7 hrs] : التعرف على اجزاء القرص الصلب • Part 3- [7 hrs]: التعرف الاعطال الشائعة في الاقراص الصلبة • Part 4- [8 hrs] : انواع الطابعات الالكترونية والاعطال التي تواجه هذه الطابعات

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	ان الإستراتيجية الرئيسية التي سيتم تبنيها في تقديم هذه الوحدة: • تشجيع طلبة هندسة الحاسوب على المشاركة بشكل مهني مع الأوساط العملية من خلال الممارسة الميدانية في دوائر الدولة . • إيجاد حلول مبتكرة ريادية لسد الاحتياجات المحلية. • بناء قيادة مهنية وأخلاقية وتعاونية في مكان العمل وفي المجتمع. • تطوير معرفتهم وخبراتهم

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	20	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	30	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7.5
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**				
	Assignments	8	15% (10)	1, 2,3,4	LO # 1, 2, 3 and 4
	Projects / Lab.	4	20% (10)	Continuous	All
	Report	2	15% (10)	2,4	LO # 2 and 4
Summative assessment	**Midterm Exam**				
	Final Exam	1 hr	50% (50)	5	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	- تعريف الطالب على اقسام وشعب الموقع التدريبي مع اعطاء نبذة مختصرة عن اجزاء الحاسبة وكيفية عملها وامكانية صيانة بعض اجزائها.
Week 2	- التعرف على اجزاء القرص الصلب وكيفية تقسيمه وطريقة خزن البيانات ومقارنته مع قرص SSDو M2 والطرق المستخدمة لتصفير القرص (NTFS,FAT16,FAT32)
Week 3	- التعرف الاعطال الشائعة في الاقراص الصلبة وكيفية معالجتها والبرامج المستخدمة في عملية اصلاح الاقراص الصلبة واسترجاع المعلومات المحذوفة او المفقودة بعد عملية الاصلاح
Week 4	- اعطاء نبذة مختصرة عن انواع الطابعات الالكترونية والاعطال التي تواجه هذه الطابعات وكيفية معالجتها. - التعرف على طبيعة الاجهزة المسيطر عليها حاسوبياً وكيفية عملها في حال توفرها في الموقع التدريبي
Week 5	**Final Exam**

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

APPENDIX:

GRADING SCHEME مخطط الدرجات				
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