Ministry of Higher Education and
Scientific Research - Iraq
Northern Technical University
Kirkuk Technical Engineering College for Computer and AI
Department of Information Technology and Computer
Networks Engineering

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	DIGITAL LOGIC DESIGN	**Module Delivery**	
Module Type	CORE	✓ **Theory**	
Module Code	ICNE-104	**Lecture**	
ECTS Credits	4	✓ **Lab**	
SWL (hr/sem)	100	**Tutorial**	
		Practical	
		Seminar	

Module Level	1	**Semester of Delivery**	1
Administering Department	ICNE	**College**	KTECCAI
Module Leader	Arkan Raoof	**e-mail**	arkan.raoof23@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	1/12/2025	**Version Number**	1.0

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module		**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 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.

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Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Ability to design Adder and Subtractor circuits. 2. Knowledge of designing encoder and decoder circuits. 3. Knowledge the Comparator, Multiplexer, Demultiplexer and places of use. 4. 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

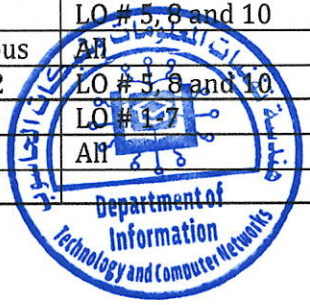
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple 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	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**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**	3	5% (10)	4,6,10	LO # 2, 10 and 11
	Assignments	3	5% (10)	2, 5,8	LO # 3, 4 and 7
	Lab.(mid pract.)	2	10%(30)	Continuous	All
	Projects	3	5% (10)	3,9,11	LO # 5, 8 and 10
	Report	6	10% (10)	Continuous	All
	Seminars	3	5% (10)	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 (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.

Digital Logic Design Program Course Description

Code	Name of the Course Unit	Semester	In-Class Hours (T+P)	Credit	ECTS Credit
ICNE-104	**Digital Logic Design**	1	4	3	4
General Information					
Language of Instruction:		**English**			
Level of the Course Unit:		**Bachelor's Degree**			



Type of the Course:	**Compulsory**
Mode of Delivery of the Course Unit	**Face to Face**
Coordinator of the Course Unit	**Dr.Ann Zeki Ablahd**
Instructor(s) of the Course Unit	

Objectives And Contents	
Objectives of the Course Unit:	To learn the basic techniques and methodologies for designing and analyzing digital systems and how to apply these techniques to build specific circuits. Define the problem (Inputs and Outputs), write its functions Implement functions using Combinational digital circuit. Minimize functions using any type of minimizing algorithms (Boolean algebra, Karnaugh-Map or Tabulation Method). Have knowledge in analyzing and designing procedures of Combinational digital circuits.
Contents of the Course Unit:	Numbers Systems, Operations, and Codes. 2- Logic Gates Boolean Algebra and Logic Simplification Combinational Logic Analysis

Week	Key Learning Outcomes Of The Course Unit On successful completion of this course unit, students/learners will or will be able to dealing with:
1	**1- Numbers Systems, Operations, and Codes**: Decimal Numbers, Binary numbers.
2	**1- Numbers Systems, Operations, and Codes**: Hexadecimal Numbers, Octal numbers.
3	**1- Numbers Systems, Operations, and Codes**: Data representation (integer and fraction) using different number systems. Conversion Between Different Numbers Systems .
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.
5	**1- Numbers Systems, Operations, and Codes:** Signed Numbers, Arithmetic Operations with Signed Numbers.
6	**1- Numbers Systems, Operations, and Codes**: Digital Codes (BCD, Excess-3, Parity, Gray ..... etc.).
7	**2- Logic Gates:** The Inverter (NOT Gate), The AND Gate, The OR Gate.
8	**2- Logic Gates:** The NAND Gate, The NOR Gate, The Exclusive-OR Gate and Exclusive-NOR Gate.
9	**3- Boolean Algebra and Logic Simplification:** Boolean Operations and Expressions.
10	**3- Boolean Algebra and Logic Simplification:** Laws and Rules of Boolean Algebra.
11	**3- Boolean Algebra and Logic Simplification** Simplification Using Boolean Algebra. DeMorgan's theorems.
12	**3- Boolean Algebra and Logic Simplification :** The Karnaugh Map (1, 2 , 3 and 4 variables) , SOP and POS Minimization.
13	**4- Combinational Logic Analysis:**

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	Basic Combinational Logic Circuits. Implementing Combinational Logic.
14	**4- Combinational Logic Analysis:** Combinational Logic Using NAND and NOR Gates. Logic Circuit Operation with Pulse Waveform Inputs.
15	**Final Exam**

No.	Practical Part
1	**Lab 1:** Introduction to digital laboratory kit operation
2	**Lab 2:** Logic Gates (AND, OR, NOT, NAND, NOR).
3	**Lab 3:** Logic Gates (XOR, XNOR).
4	**Lab 4:** Design of (AND, OR, NOT) gates Using NAND gates.
5	**Lab 5:** Design of (AND, OR, NOT) gates Using NOR gates.
6	**Lab 6:** Implementation of logic circuits using NANAD-gate only.
7	**Lab 7:** Implementation of logic circuits using NOR-gate only.
8	**Lab 8:** Implementation of DeMorgan theory, 1st Law
9	**Lab 9:** Implementation of DeMorgan theory, 2nd Law
10	**Lab 10:** Design of a combinational logic circuits . Part 1
11	**Lab 11:** Design of a combinational logic circuits. Part 2
12	**Lab 12:** Realization of Boolean equation. Part 1
13	**Lab 13:** Realization of Boolean equation. Part 2
14	**Lab 14:** Review

Workload & ECTS Credits of The Course Unit : ICNE-104		Digital Logic Design	
Workload For Learning & Teaching Activities			
Type of the Learning Activities	Learning Activities (# of week)	Duration (hours, h)	Workload (h)
Lecture & In-Class Activities	15	2	30
Preliminary & Further Study	4	2	8
Land Surveying	NA	NA	NA
Group Work	5	1	5
Laboratory	14	2	28
Reading	2	3	6
Assignment (Homework)	8	1	8
Project Work	1	3	3
Seminar	3	1	3
Internship	NA	NA	NA
Technical Visit	1	5	5
Web Based Learning	5	2	10
Implementation/Application/Practice	NA	NA	NA
Practice at a workplace	NA	NA	NA
Occupational Activity	NA	NA	NA
Social Activity	NA	NA	NA
Thesis Work	NA	NA	NA
Field Study	NA	NA	NA
Report Writing	8	2	16
Final Exam	1	3	3
Preparation for the Final Exam	1	20	20
Mid-Term Exam	1	2	



Preparation for the Mid-Term Exam	1	12	12
Short Exam (Quizzes)	8	0.5	4
Preparation for the Short Exam	8	1.5	12
Total Workload of the Course Unit	**86**	**63**	**175**
Workload (h) / 25			**175÷25**
ECTS Credits allocated for the Course Unit			**7**

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	**DC Circuit Analysis**	**Module Delivery**	
Module Type	**Basic**	☒ **Theory** **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ICNE-105		
ECTS Credits	**6**		
SWL (hr/sem)	**150**		
Module Level	1	**Semester of Delivery**	1
Administering Department	**ICNE**	**College**	**KTECCAI**
Module Leader	Dr. Ali Mardan	**e-mail**	ali.mardan@ntu.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.
Module Tutor	N/A	**e-mail**	
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	01/11/2025	**Version Number**	1.0
Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	



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

Module Aims أهداف المادة الدراسية	This course is an introductory course in electric circuit analysis. It mainly deals with the basic concept of electrical circuits and introduces the principles and theories for DC circuit analyses. The course aims: 1. To introduce the basic elements of electrical circuits. 2. To understand voltage, current, and power from a given circuit. 3. To understand and apply various techniques and theorems to analyze electrical circuits. 4. To conduct laboratory experiments to understand practically the fundamental concepts of electrical circuits. 5. To develop problem solving skills and understanding of circuit theory through the application of techniques.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A student who has successfully completed this course should be able to: 1. Describe electrical charge, current, voltage, and power. 2. Recognize how electricity works in electrical circuits. 3. Identify the basic electrical circuit elements. 4. Understand and apply various techniques and theorems to analyze electric circuits. 5. Discuss the operations of sinusoid and phasors in an electric circuit. 6. Discuss the various properties of resistors, capacitors, and inductors. 7. Identify the capacitor and inductor phasor relationship with respect to voltage and current. 8. Use systematic problem solving techniques to partition complex problems. 9. Use laboratory instruments such as power supplies, multimeters, oscilloscope, and others. 10. Perform experiments and interpret the obtained results.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: DC circuits – Current and voltage definitions, passive sign convention and circuit elements, combining resistive elements in series and parallel, voltage and current division. Kirchhoff's laws and Ohm's law. Introduction to mesh and nodal analysis, maximum power transfer. Source transformation, introduction to Thevenin and Norton equivalent circuits.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The teaching methods will include lectures, class discussion, homework assignments, and Lab reports. Lecture notes, announcements, and Lab manual will be posted on an appropriate communication platform.



Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, and 8
	Assignments	5	10% (10)	Continuous	LO # 1,2,3,4,5, 6, and 8
	Projects / Lab.	0			
	Lab/Reports	8	20% (20)	Continuous	LO # 9 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-4
	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 – symbols and abbreviations, units, electric circuit and its elements. The direct current network - Ohm's Law, Kirchhoff's laws and their use in network analysis.
Week 2	Series circuits, parallel circuits, series-parallel circuits. Open and short circuits, source transformation, and delta-star transformation.
Week 3	Nodal voltage method, Loop (Mesh) current method.
Week 4	Superposition theorem, Thevenin's theorem, and Norton's theorem.
Week 5	Maximum power transfer theorem, reciprocity theorem.
Week 6	The alternating current network. Types of alternating waveforms, generation of alternating current, definitions related to alternating waveforms, the mean values of current and voltage, the effective values of current and voltage.
Week 7	Mid-term Exam - Circuit elements in the phasor domain, the vector diagram.
Week 8,9	Reviews for complex numbers and their mathematical operations. Series and parallel AC circuits, the instantaneous power and mean power of AC, reactive power, and apparent power.

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Week 10,11	Using Kirchhoff's laws to solve AC circuits, using Loop's method to solve AC circuits, using Superposition's method to solve AC circuits, using Thevenin's theorem to solve AC circuits, using Norton's theorem to solve AC circuits.
Week 12,13	Three-phase system, three-phase current, Y connection, delta connection. Solving three-phase networks with balanced loads, solving three-phase networks with unbalanced loads.
Week 14	Electromagnetism, permanent and artificial magnets, the magnetic field, the flux density, the magnetic reluctance, the permeability, the mmf, the magnetic force, the electromagnetic circuits.
Week 15	The implementation of B-H curves for solving electromagnetic circuits. Transformers, the hysteresis losses, the eddy current losses. Direct current machines, direct current generators, asynchronous and synchronous machines.
Week 16	**Preparatory week before the final exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Laboratory regulations and safety rules.
Week 2	Introduction to basic lab equipment, circuit tools, dc measurements, pre-lab knowledge.
Week 3	Resistor color code measurement.
Week 4	Ohm's law.
Week 5,6	Series-parallel resistors.
Week 7,8	Kirchhoff's law.
Week 9	Mid-term
Week 10	Norton's theorem.
Week 11	Thevenin's theorem.
Week 12, 13	Superposition theorem.
Week 14,15	Maximum power transfer theorem.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	"Electric Circuits Fundamentals" by Floyd ISBN: 0130163945 Publisher: Prentice Hall	No



Recommended Texts	"Introductory Circuit Analysis", 13th edition by Boylestad ISBN: 978-0-13-392360-5 Publisher: Prentice Hall	No
Websites		

Grading Scheme
مخطط الدرجات

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

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

DC Circuit Analysis Program Course Description

Code	Name of the Course Unit	Semester	In-Class Hours (T+P)	Credit	ECTS Credit
ICNE-105	DC Circuit Analysis	1	4	3	6

General Information	
Language of Instruction:	**English**
Level of the Course Unit:	**Bachelor's Degree**
Type of the Course:	**Compulsory**
Mode of Delivery of the Course Unit	**Face to Face**
Coordinator of the Course Unit	**Dr.Ali Mardan**
Instructor(s) of the Course Unit	**Dr.Ali Mardan**

Objectives And Contents	
Objectives of the Course Unit:	To provide the fundamental concept of DC electrical circuits.
Contents of the Course Unit:	1-General Electric System. 2- DC circuits. 3- Network Theorems

Week	Key Learning Outcomes Of The Course Unit On successful completion of this course unit, students/learners will or will be able to dealing with:
1	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.
2	General Electric System:



	Ohm's law, Resistors, Resistivity, Temperature rise & Temperature coefficient of resistance, Voltage & Current sources
3	2- DC circuits: Series circuits , Parallel circuits.
4	2- DC circuits: Kirchhoff's laws.
5	2- DC circuits: Power and energy .
6	3- Network Theorems: Star-delta & delta-star transformation
7	3- Network Theorems:Sources transformations
8	3- Network Theorems:Mesh analysis.
9	3- Network Theorems: Nodal analysis.
10	3- Network Theorems:Superposition theorem.
11	3- Network Theorems: Thevnin's theorem
12	3- Network Theorems: Nortan's theorem
13	3- Network Theorems: Maximum power transfer theorem.
14	3- Network Theorems: Reciprocity theorem
15	Final Exam

No.	Practical Part
1	**Lab 1:** Connection of resistances in series and parallel.
2	**Lab 2:** Verification of Ohm's law using hardware .
3	**Lab 3:** Verification of Ohm's law using digital simulation.
4	**Lab 4:** Verification of Kirchhoff's current law and Voltage law using hardware.
5	**Lab 5:** Verification of Kirchhoff's current law and Voltage law using digital simulation.
6	Lab 6: Determination of mesh currents using hardware.
7	Lab 7: Determination of mesh currents using digital simulation.
8	**Lab 8:** Measurement of nodal voltages using hardware and digital simulation.
9	**Lab 9:** Verification of superposition theorem using hardware .
10	**Lab 10:** Verification of superposition theorem using digital simulation.
11	**Lab 11:** Verification of Thevnin's theorem using hardware.
12	**Lab 12:** Verification of Thevnin's theorem using hardware.
13	**Lab 13:** Verification of Nortan's using hardware.
14	**Lab 14:** Verification of Nortan's using digital simulation.

Workload & ECTS Credits of The Course Unit : ICNE-105 Electrical Engineering Fundamentals

Workload For Learning & Teaching Activities

Type of the Learning Activities	Learning Activities (# of week)	Duration (hours, h)	Workload (h)
Lecture & In-Class Activities	15	2	30
Preliminary & Further Study	4	2	8
Land Surveying	NA	NA	NA
Group Work	5	1	5
Laboratory	14	2	28
Reading	2	3	6
Assignment (Homework)	8	1	8
Project Work	1	3	3
Seminar	3	1	3
Internship	NA	NA	NA
Technical Visit	1	5	5
Web Based Learning	5	2	10
Implementation/Application/Practice	NA	NA	NA



Practice at a workplace	NA	NA	NA
Occupational Activity	NA	NA	NA
Social Activity	NA	NA	NA
Thesis Work	NA	NA	NA
Field Study	NA	NA	NA
Report Writing	8	2	16
Final Exam	1	3	3
Preparation for the Final Exam	1	20	20
Mid-Term Exam	1	2	2
Preparation for the Mid-Term Exam	1	12	12
Short Exam (Quizzes)	8	0.5	4
Preparation for the Short Exam	8	1.5	12
Total Workload of the Course Unit	**86**	**63**	**175**
Workload (h) / 25			**175÷25**
ECTS Credits allocated for the Course Unit			**7**

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	**Engineering Drawing**	**Module Delivery**	
Module Type	**Core**	☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ICNE-103		
ECTS Credits	**4**		
SWL (hr/sem)	**100**		
Module Level	1	**Semester of Delivery**	1
Administering Department	**ICNE**	**College**	**KTECCAI**
Module Leader	Burkan Ahmed	**e-mail**	Burkan_Ahmed@ntu.edu.iq
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	01/11/2025	**Version Number**	1.0



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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1-Enabling students to obtain knowledge and understanding in the subject of engineering drawing and using the computer through the AutoCAD program 2- Understanding and teaching students the basics of engineering drawing related to computer engineering 3- Knowing the correct methods of engineering drawing using the computer and how to apply them in the AutoCAD program in the fields of engineering and computer engineering. 4- Increasing the student's experience in identifying drawing and designing engineering and electronic shapes and drawing connections and electrical circuits.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**A- Cognitive goals** A1- Giving the student sufficient knowledge in the AutoCAD program to employ it in design by developing the students' practical, theoretical and creative abilities in computer design techniques of various types. A2- Developing perception skills and knowing the technique of implementing design using the computer to enrich the students' experience through the use of the various techniques of the AutoCAD program to complete the required design plans. A3- That the student be able to make any design scheme on the program through which he can fully clarify the idea. **b- The program's skill objectives** B1- Providing the student with the skill of computer design easily and easily through using samples from the student's reality and applying them directly. These samples are chosen based on the level that the student reaches. Some exercises or projects to be completed in other subjects such as designing electrical circuits and logic can be used. B2- Developing the student's imagination skill to feel the difference between the AutoCAD program environment and the realistic building space, the different areas of the blocks within the proportional system of the total space, and how to draw projections of furniture pieces and interior spaces in easy ways.
Indicative Contents المحتويات الإرشادية	1- Enable students to apply a large number of drawings through the AutoCAD program. 2 - Enabling students and providing them with mechanisms to search for information within what is available on scientific sites on the Internet. 3- Raising the student's self-confidence by linking the theoretical material with the practical reality. 4 - Developing students' skills in how to deal with physical and software computer

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	problems and how to deal with them.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Providing students with the basics, additional topics, and field experiences related to the outputs of thinking and analysis. 2- Creating panel discussions during or outside the lectures to discuss scientific engineering topics that require thinking and analysis. 3- Asking the students a set of thinking questions during the lectures such as (what, how, when, why) for specific topics. 4- Giving students homework and periodic reports.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**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**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	20% (10)	7	LO # 1-7
	Final Exam	2hr	40% (50)	16	All
Total assessment			100% (100 Marks)		



Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1,2	The use of CAD in engineering drawing, description of menu Bar and toolbars
Week 3	Draw /Text, Dimension, Format/ units, Proprieties
Week 4,5	Drawing commands, drawing tools, modify tools drawing Ellipse Rectangle, Line Ray, Circle, Polygon, Point Arc, ---------- etc.
Week 6	Creating elevation and section
Week 7	Creating line sketch to plan and dimensions in layer
Week 8	CAD Electrical and Electronic Mechanical/ Special features The use of various layers,
Week 9	Midterm Exam
Week 10-11	editing commands:copy, cut, paste, erase, move,
Week 12,13	selecting objects,
Week 14.15	Orthogonal projection, Isometric drawing.
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	• المحاضرات المقدمة من قبل مدرس المادة • الكتب المتوفرة في مكتبة الكلية • الكتب الموجودة داخل الclass room	No
Recommended Texts	• AutoCAD Beginning and Intermediate • AutoCAD from zero to hero	No
Websites	اي موقع الكتروني له علاقة بدراسة اتوكاد	



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

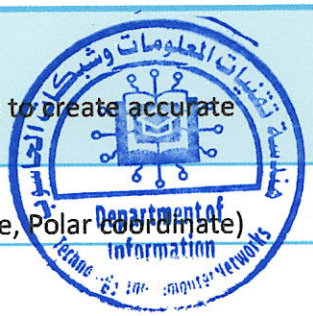
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original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

Engineering Drawing Program Course Description

Code	**Name of the Course Unit**	**Semester**	**In-Class Hours (T+P)**	**Credit**	**ECTS Credit**
ICNE-103	**Engineering Drawing**	1	4	3	4

General Information	
Language of Instruction:	**English**
Level of the Course Unit:	**Bachelor's Degree**
Type of the Course:	**Compulsory**
Mode of Delivery of the Course Unit	**Burkan Ahmed**
Coordinator of the Course Unit	**Burkan Ahmed**
Instructor(s) of the Course Unit	
Objectives And Contents	
Objectives of the Course Unit:	Define engineering drawing material, its uses and Engineering drawing tools Introduction to Engineering drawing through AutoCAD software Developing the student's mental and abilities in drawing simple and complex shapes Decomposes 3D shapes into binary projections
Contents of the Course Unit:	1- Introduction to AutoCAD software 2- Draw menu 3- modify menu 4- Layers and properties 5- projection 6- stereoscopic shapes

Week	**Key Learning Outcomes Of The Course Unit** **On successful completion of this course unit, students/learners will or will be able to dealing with:**
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.
2	Coordinate method (Direct distance method, Absolute coordinate, Relative coordinate, Polar coordinate)



3	Draw menu (line, poly line, polygon, rectangle).
4	Drawing objects of Pentagonal, hexagonal and octagonal shapes
5	Draw menu (arc, circle, ellipse, point and text).
6	Draw several shapes containing circles and texts
7	Modify menu (erase, copy, mirror, move offset,)
8	Modify menu (rotate, trim, extend, explode)
9	Properties and Layers in AutoCAD and dimension
10	Orthographic projection
11	Draw the three projection(front, side and top) of some shapes
12	Basics of drawing stereoscopic shapes
13	Draw stereoscopic shape
14	Printing the graphic
15	**Final Exam**

No.	Practical Part
1	**Lab 1:** Definition of AutoCAD interface
2	**Lab 2:** Applications of Coordinate method
3	**Lab 3:** Draw figures of lines, polygons and rectangle
4	**Lab 4**: Drawing objects of Pentagonal, hexagonal and octagonal shapes
5	**Lab 5**:Drawing figures of circles and ellipse
6	**Lab 6**: Draw several shapes containing circles and texts
7	**Lab 7:** Applications of some order in modify menu
8	**Lab 8**: Applications of other order in modify menu
9	**Lab 9**: Practicing of using layers
10	**Lab 10:**Practicing of projection of simple figure
11	**Lab 11**: Draw three projection of figure
12	**Lab 12**: Practicing of drawing stereoscopic shapes
13	**Lab 13**: Draw stereoscopic shape
14	**Lab 14:** Practicing of Printing the graphic

Workload & ECTS Credits of The Course Unit :	**ICNE-103**	**Engineering Drawing**
Workload For Learning & Teaching Activities		
Type of the Learning Activites	Learning Activities (# of week)	Duration (hours, h) Workload (h)
Lecture & In-Class Activities	14	1 14
Preliminary & Further Study	NA	NA NA
Land Surveying	NA	NA NA
Group Work	NA	NA NA



Laboratory	14	2	28
Reading	NA	NA	NA
Assignment (Homework)	5	1	5
Project Work	1	1	1
Seminar	NA	NA	NA
Internship	NA	NA	NA
Technical Visit	NA	NA	NA
Web Based Learning	NA	NA	NA
Implementation/Application/Practice	NA	NA	NA
Practice at a workplace	NA	NA	NA
Occupational Activity	NA	NA	NA
Social Activity	NA	NA	NA
Thesis Work	NA	NA	NA
Field Study	NA	NA	NA
Report Writing	NA	NA	NA
Final Exam	1	3	3
Preparation for the Final Exam	1	10	10
Mid-Term Exam	1	2	2
Preparation for the Mid-Term Exam	1	5	5
Short Exam (Quizzes)	4	1	4
Preparation for the Short Exam	3	1	3
Total Workload of the Course Unit	**45**	**27**	**75**
Workload (h) / 25			**75÷25**
ECTS Credits allocated for the Course Unit			**3**

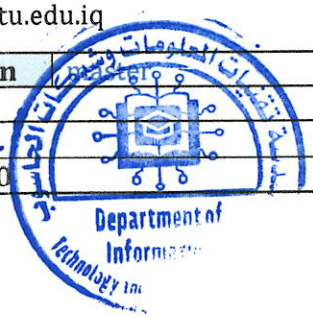
MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	**DEMOCRACY AND HUMAN RIGHTS**	**Module Delivery**	
Module Type	BASIC	✓ **Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	NTU-100		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	**Semester of Delivery**	1
Administering Department	**ICNE**	**College**	**KTECCAI**
Module Leader	Bashaer Mohmed	**e-mail**	bashaar1988@ntu.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Master
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	1/12/2025	**Version Number**	1.0



Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

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

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

Module 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 Outcomes مخرجات التعلم للمادة الدراسية	1 - فهم ومعرفة وأدراك حقوقه التي اقرها الله له وللبشر جميعاً وبالتالي فهي هبه وليس مكسب من أحد ولا يحق لأي شخص 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 – استراتيجية مهارة التفكير العالية – استراتيجية التفكير الناقد في التعلم – العصف الذهني

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

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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	

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	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.

Democracy and Human Rights Program Course Description

Code	**Name of the Course Unit**	**Semester**	**In-Class Hours (T+P)**	**Credit**	**ECTS Credit**
NTU100	**Democracy and Human Rights**	1	2	2	2

General Information	
Language of Instruction:	**Arabic**
Level of the Course Unit:	**Bachelor's Degree**
Type of the Course:	**Compulsory**
Mode of Delivery of the Course Unit	**Basheer Ahmed**
Coordinator of the Course Unit	**Basheer Ahmed**
Instructor(s) of the Course Unit	

Objectives And Contents	
Objectives of the Course Unit:	**أهداف مادة حقوق الانسان والديمقراطية:** تعريف الطالب بحقوق الانسان والديمقراطية ومضامينها وتصنيف الحريات العامة
Contents of the Course Unit:	**المحتويات:** تعريف الطالب على مفهوم الحقوق والديمقراطية على الصعيد الوطني والاقليمي والعالمي

Week	Key Learning Outcomes Of The Course Unit On successful completion of this course unit, students/learners will or will be able to dealing with:
1	حقوق الانسان ، تعريفها ، اهدافها حقوق الانسان في الحضارات القديمة وخصوصا حضارة وادي الرافدين
2	حقوق الانسان في الشرائع السماوية مع التركيز على حقوق الانسان في الاسلام
3	حقوق الانسان في التاريخ المعاصر والحديث : الاعتراف الدولي بحقوق الانسان منذ الحرب العالمية الأولى وعصبة الامم المتحدة
4	الاقليمية لحقوق الانسان : الاتفاقية الاوربية لحقوق الانسان 1950 ، الاتفاقية الامريكية لحقوق الانسان 1969 ، الا...

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	الميثاق الافريقي لحقوق الانسان 1981 ، الميثاق العربي لحقوق الانسان 1994
5	حقوق الانسان الحديثة : الحقائق في التنمية ، الحق في البيئة النظيفة ، الحق في التضامن ، الحق في الدين حقوق الانسان ، المنظمات الوطنية لحقوق الانسان)
6	حقوق الانسان في الدساتير العراقية بين النظرية والواقع
7	حقوق الانسان الاقتصادية والاجتماعية والثقافية و حقوق الانسان المدنية والسياسية
8	حقوق الانسان الحديثة : الحقائق في التنمية ، الحق في البيئة النظيفة ، الحق في التضامن ، الحق في الدين
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
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
11	مصطلح الديمقراطية ، نشأته، دلالته، تاريخ الديمقراطية.
12	الاسلام والديمقراطية ومساوئ الحكم الاستبدادي .
13	الانتقادات الموجهة للديمقراطية، ومحاسن النظام الديمقراطي .
14	الديمقراطي الأنظمة الديمقراطية في العالم/الديمقراطية في العالم الثالث/ المشاكل التي تواجه البلدان العربية في التحول
15	الامتحان النهائي

Workload & ECTS Credits of The Course Unit :	NTU100	Democracy and Human Rights	
Workload For Learning & Teaching Activities			
Type of the Learning Activites	Learning Activities (# of week)	Duration (hours, h)	Workload (h)
Lecture & In-Class Activities	14	2	28
Preliminary & Further Study	NA	NA	NA
Land Surveying	NA	NA	NA
Group Work	NA	NA	NA
Laboratory	NA	NA	NA
Reading	6	0.5	3
Assignment (Homework)	NA	NA	NA
Project Work	NA	NA	NA
Seminar	NA	NA	NA
Internship	NA	NA	NA
Technical Visit	NA	NA	NA
Web Based Learning	NA	NA	NA
Implementation/Application/Practice	NA	NA	NA
Practice at a workplace	NA	NA	NA
Occupational Activity	NA	NA	NA
Social Activity	NA	NA	NA
Thesis Work	NA	NA	NA
Field Study	NA	NA	NA
Report Writing	NA	NA	NA
Final Exam	1	3	3
Preparation for the Final Exam	1	10	10
Mid-Term Exam	1	2	2
Preparation for the Mid-Term Exam	1	5	5
Short Exam (Quizzes)	3	0.5	1.5

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Preparation for the Short Exam	3	0.5	1.5
Total Workload of the Course Unit	30	23.5	54
Workload (h) / 25			54÷25
ECTS Credits allocated for the Course Unit			2

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**English Language 1**			**Module Delivery**	
Module Type	B			☒ Theory Lecture ☐ Lab ☐ Tutorial ☐ Practical Seminar	
Module Code	NTU-101				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	1		**Semester of Delivery**	1	
Administering Department	ICNE		**College**	KTECCAI	
Module Leader	Muamar Almani Jasim		**e-mail**	muamar78@ntu.edu.iq	
Module Leader's Acad. Title	Assistant lecturer		**Module Leader's Qualification**	Master	
Module Tutor	Name (if available)		**e-mail**		
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/11/2025		**Version Number**	1.0	

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



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

Module Aims أهداف المادة الدراسية	The aim of this English Language Lecture is to provide students with a comprehensive understanding of the English language, including its structure, usage, and various linguistic aspects. The lecture aims to enhance students' language skills and improve their overall proficiency in English.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate a solid understanding of the fundamental aspects of English grammar, vocabulary, and syntax. 2. Apply effective reading strategies to comprehend and analyze a variety of written texts. 3. Produce coherent and well-structured written pieces using appropriate grammar, vocabulary, and style. 4. Listen actively and comprehend spoken English in various contexts, including formal and informal situations. 5. Engage in meaningful conversations and deliver clear and organized oral presentations in English. 6. Critically evaluate and analyze linguistic elements in literature, media, and other forms of communication. 7. Recognize and appreciate the historical and cultural contexts that have shaped the English language.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Introduction to the English language and its global significance. 2. Overview of English grammar, including parts of speech, sentence structure, and verb tenses. 3. Building vocabulary and word choice for effective communication. 4. Reading comprehension strategies and analysis of different types of texts. 5. Developing writing skills, including organization, coherence, and proper grammar usage. 6. Listening comprehension and effective note-taking techniques. 7. Speaking skills development, including conversation, pronunciation, and presentation skills. 8. Literary analysis and interpretation of English language texts. 9. Historical and cultural influences on the English language. 10. Contemporary issues and challenges in the English language.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	1. Lecture delivery: The instructor will present concepts, explanations, and examples through interactive lectures, incorporating visual aids, multimedia resources, and real-life examples. 2. Group activities: Students will engage in group discussions, peer-to-peer interactions, and collaborative learning tasks to reinforce their understanding

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	of concepts and develop their communication skills. 3. Practical exercises: Students will participate in individual and group exercises, such as grammar quizzes, writing assignments, and pronunciation drills, to apply their knowledge and receive feedback. 4. Multimedia resources: The lecture may incorporate audiovisual materials, online resources, and language learning software to provide a dynamic and interactive learning experience. 5. Assessments: Regular assessments, including quizzes, exams, and assignments, will be conducted to gauge students' progress and provide constructive feedback for improvement. 6. Self-directed learning: Students will be encouraged to engage in independent learning outside of the lecture through recommended readings, online resources, and language practice exercises.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**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

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	0	0	5, 12	LO #1, 3 and 7
	Assignments	0	30% (30)	4, 13	LO # 2, 4 and 6
	Projects / Lab.	0	0%		
	Report	1	20% (10)	13	All
Summative assessment	Midterm Exam	2 hr.	20% (30)	7	LO # 1-6
	Final Exam	2 hr.	30% (30)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

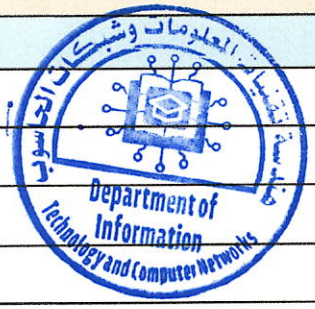
المنهاج الاسبوعي النظري

	Material Covered
Week 1	• Introduction to the English language • Greetings and basic conversational phrases

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Week 2	• Words in English (Book 3)
Week 3	• Basic sentence structure: Subject + verb + object • Words in English (Book 3)
Week 4	• Personal pronouns: I, you, he/she/it • Words in English (Book 3)
Week 5	• Present tense of "to be" • Words in English (Book 3)
Week 6	• Describing oneself and others • Words in English (Book 3)
Week 7	• Mid-term Evaluation
Week 8	• Nouns and articles: A, an, the • Plural nouns
Week 9	• Expressing possession with 's • Words in English (Book 3)
Week 10	• Present tense verbs: Regular verbs • Words in English (Book 3)
Week 11	• Daily routines and activities • Words in English (Book 3)
Week 12	• Adverbs of frequency • Words in English (Book 3)
Week 13	• Time expressions: Days of the week, months, and telling time. • Words in English (Book 3)
Week 14	• Prepositions of time: In, on, at • Words in English (Book 3)
Week 15	• Review and reinforcement of previous topics before final term evaluation

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



Week 5	
Week 6	
Week 7	

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	English Grammar in Use by Raymond Murphy 5th edition	No
Recommended Texts	4000 Essential English words 2nd edition	No
Websites	http://www.duolingo.com/ http://www.bbc.co.uk/learningenglish	

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.

English Language Program Course Description

Code	Name of the Course Unit	Semester	In-Class Hours (T+P)	Credit	ECTS Credit
NTU101	English Language	2	2	2	2

General Information	
Language of Instruction:	English
Level of the Course Unit:	Bachelor's Degree
Type of the Course:	Compulsory
Mode of Delivery of the Course Unit	**Face to Face**
Coordinator of the Course Unit	Muamer Almani
Instructor(s) of the Course Unit	Muamer Almani
Objectives And Contents	
Objectives of the Course Unit:	Introduce the student to general English through reading, writing, listening, and speaking.
Contents of the Course Unit:	Grammar, Vocabulary, Reading, Speaking, Listening, and



	Everyday English
Week	Key Learning Outcomes Of The Course Unit On successful completion of this course unit, students/learners will or will be able to dealing with:
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.
2	Reading: the many ways we communicate Speaking: Information gap Listening: Neighbors
3	Grammar: Present tenses: Present Simple, Present Continuous, have/have got Vocabulary: Describing countries, Collocation Everyday English: Making conversation
4	Reading: three people talk about their experiences Speaking: people's lifestyles Listening: what annoys you about the people in your life?
5	Grammar: Past tenses: Past Simple, Past Continuous Vocabulary: Irregular verbs, making connections, Nouns, verbs, and adjectives, Making negatives. Everyday English: Time expressions
6	Reading: Newspaper stories Speaking: Telling stories Listening: A radio drama
7	Grammar: Quantity, Articles Vocabulary: Buying things Everyday English: Prices and shopping
8	Reading: 'The best shopping street in the world' Speaking: Town survey, attitudes to shopping Listening: Buying things
9	Grammar: Verb patterns 1, Future intentions Vocabulary: Hot verbs Everyday English: How do you feel?
10	Reading: Hollywood kids Speaking: Being a teenager Listening: You've got a friend
11	Grammar: Comparative and superlative adjectives Vocabulary: Synonyms and antonyms Everyday English: Directions
12	Reading: 'A Tale of two millionaires' Speaking: comparing cities Listening: Living in another country
13	Grammar: Present Perfect and Past Simple Vocabulary: Past participles, Adverbs, Word pairs Everyday English: Short answers
14	Reading: Celebrity interview Speaking: Roleplay Listening: An interview with the band
15	Final Exam
Workload & ECTS Credits of The Course Unit :	NTU101 English Language
Workload For Learning & Teaching Activities	
Type of the Learning Activities	Learning Activities / Duration / Workload



	(# of week)	(hours, h)	(h)
Lecture & In-Class Activities	14	2	28
Preliminary & Further Study	NA	NA	NA
Land Surveying	NA	NA	NA
Group Work	2	1	2
Laboratory	NA	NA	NA
Reading	NA	NA	NA
Assignment (Homework)	2	1	2
Project Work	NA	NA	NA
Seminar	2	1	2
Internship	NA	NA	NA
Technical Visit	NA	NA	NA
Web Based Learning	1	1	1
Implementation/Application/Practice	NA	NA	NA
Practice at a workplace	NA	NA	NA
Occupational Activity	NA	NA	NA
Social Activity	NA	NA	NA
Thesis Work	NA	NA	NA
Field Study	NA	NA	NA
Report Writing	2	1	2
Final Exam	1	3	3
Preparation for the Final Exam	1	3	3
Mid-Term Exam	1	2	2
Preparation for the Mid-Term Exam	1	2	2
Short Exam (Quizzes)	2	0.5	1
Preparation for the Short Exam	2	1	2
Total Workload of the Course Unit	31	18.5	50
Workload (h) / 25			50÷25
ECTS Credits allocated for the Course Unit			2



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	ICNE-102		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	1	**Semester of Delivery**	1
Administering Department	**ICNE**	**College**	**KTECCAI**
Module Leader	Dr.Ebtihal Sabah Majeed	**e-mail**	ebtehal.sabah23@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	1/12/2025	**Version Number**	1.0

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

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

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

Module 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	5. Learning about the basic Matrix and Determinants 6. Learning the Algebraic functions, natural logarithm, the exponential function, trigonometric functions, inverse trigonometric functions and hyperbolic functions. 7. Learning the Derivatives formula and chain rule. 8. Learning the Integration, Indefinite and Definite Integral 9. 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

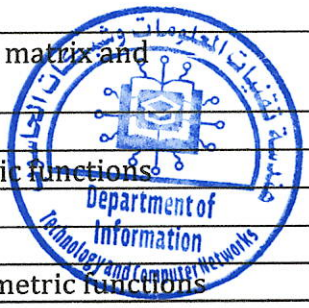
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي 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	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.

Engineering Mathematics Program Course Description

Code	Name of the Course Unit	Semester	In-Class Hours (T+P)	Credit	ECTS Credit
ICNE-102	Engineering Mathematics	1	4	3	4

General Information	
Language of Instruction:	English
Level of the Course Unit:	Bachelor's Degree
Type of the Course:	Compulsory
Mode of Delivery of the Course Unit	Face to Face
Coordinator of the Course Unit	Dr.Ebtihal Sabah
Instructor(s) of the Course Unit	Dr.Ebtihal Sabah
Objectives And Contents	Help the student to understand the laws and issues necessary for the purpose of solving simple and complex electrical circuits.



Objectives of the Course Unit:	To learn the
Contents of the Course Unit:	1- Matrix and Determinants 2- Review of Functions 3- Derivatives 4- Integration

Week	Key Learning Outcomes Of The Course Unit On successful completion of this course unit, students/learners will or will be able to dealing with:
1	Matrix, properties, and operations
2	Determinants and properties of determinants Inverse of square matrix by determinants
3	Solving linear System equations using the inverse of the coefficient matrix and Cramer's rule
4	Algebraic functions
5	Review of natural logarithm, the exponential function, trigonometric functions
6	inverse trigonometric functions and hyperbolic functions
7	Derivatives formula and chain rule.
8	Derivatives of natural logarithm, the exponential function, trigonometric functions
9	inverse trigonometric functions and hyperbolic functions.
10	Applications of differentiation.
11	Review of Integration, Indefinite and Definite Integral
12	Integration method
13	Integration method
14	Applications of integration, approximation(trapezoidal rule, Simpson's rule) Area between curves
15	Final Exam

Workload & ECTS Credits of The Course Unit : ICNE-102 Engineering Mathematics

Workload For Learning & Teaching Activities

Type of the Learning Activites	Learning Activities (# of week)	Duration (hours, h)	Workload (h)
Lecture & In-Class Activities	15	3	45
Preliminary & Further Study	NA	NA	NA
Land Surveying	NA	NA	NA
Group Work	NA	NA	NA
Laboratory	NA	NA	NA
Reading	NA	NA	NA
Assignment (Homework)	13	1	13
Project Work	NA	NA	NA
Seminar	NA	NA	NA
Internship	NA	NA	NA
Technical Visit	NA	NA	NA
Web Based Learning	5	2	10



Implementation/Application/Practice	NA	NA	NA
Practice at a workplace	NA	NA	NA
Occupational Activity	NA	NA	NA
Social Activity	NA	NA	NA
Thesis Work	NA	NA	NA
Field Study	NA	NA	NA
Report Writing	NA	NA	NA
Final Exam	1	3	3
Preparation for the Final Exam	1	20	20
Mid-Term Exam	1	2	2
Preparation for the Mid-Term Exam	1	16	16
Short Exam (Quizzes)	8	0.5	4
Preparation for the Short Exam	8	1.5	12

Total Workload of the Course Unit	53	49	125
Workload (h) / 25			100÷25
ECTS Credits allocated for the Course Unit			4

Introduction To computing & Problem Solving

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Introduction To computing & Problem Solving**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**ICNE-101**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	**ICNE**		**College**	**KTECCAI**	
Module Leader	Sazeen Taha Abd Razag		**e-mail**	Sazeentaha4@ntu.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Sazeen Taha Abd Razag		**e-mail**	Sazeentaha4@ntu.edu.iq	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/11/2025		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To develop problem solving skills by splitting the problem into small steps. 2. **This course aims to provide the students with an appreciation of the role of computers programming language level 1.** 3. **It aims to provide the students the steps of designing the algorithms and flowcharts to simplified programming in C++.**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. An ability to apply C++ program for solve the problems. 2. An ability to analyze a problem, and identify and define the computing requirements appropriate to its C++ solution 3. An ability to design, implements, and evaluate a computer-C++ programming language. 4. An ability to function effectively on teams to accomplish a common goal 5. An understanding of professional, ethical, legal ways of programming and designing the problem state. 6. An ability to understand and follow the C++ program. 7. An ability to analyze the local and global impact of computing programming on individuals, organizations, and society. 8. Recognition of the need for and an ability to design the algorithms and flowcharts continuing professional development 9. An ability to use current techniques, skills, and tools necessary for computing programming practice. 10. An ability to apply algorithmic principles, and computer science theory in the programming and design of computer-based programming systems. 11. An ability to apply design and development principles in the construction of software systems of varying Programming languages.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - Algorithms</u> Algorithm converting the problem into steps by using algorithms and the base of analyze the problem into steps. <u>Part B – Flowchart</u> Flowchart makes it easier to spot inconsistencies and perform analysis. Flowcharts are also a great tool to help users maintain proper documentation standards while working on a project.

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	Flowcharts create visual representations of processes. For this reason, they are popular among programmers, decision makers, and problem solvers. Manually creating flowcharts is often quite time consuming. After all, by hand, you have to draw the shapes and other elements. Furthermore, manual revisions often require a substantial amount of effort. Fortunately, flowchart software makes flowcharting simple and straightforward. Users can access templates and libraries of shapes and connectors to quickly assemble complicated diagrams that are easily shared and revise. Part C- Programming in C++ The main advantages of C++ are that it is a highly efficient language, has excellent performance, and boasts great memory management. C++ also supports object-oriented programming principles, making development more manageable and organized. C++ is a general-purpose, statically-typed programming language with elements of object-oriented programming (OOP) and functional development. It is part of the C-family of languages, and, in fact, is an extension of C originally conceived of as C with Classes – a nod to the fact that it allows developers to use classes and objects in their code. The actual ++ portion of the name comes from C's ++ or incremental operator, a sort of programmer joke about C++ being an incremental step-up from C. The language was created by Bjarne ,Stroustrup and developed by the ISO/IEC Joint Technical Committee back in 1985.

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	123	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	8
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم المادة الدراسية				
As	**Time/Number**	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
Week 1	Introduction to algorithms
Week 2	Introduction to flowcharts
Week 3	Introduction to C++ (Structure of a program)
Week 4	Variables, Data types, Declaration of variables, Scope of variables, Expression and Basic Input /Output.
Week 5	String handling, local and global variables
Week 6	Operator (Assignment ,Arithmetic operator, Increase and decreased)
Week 7	Making decisions (If statement)
Week 8	Loop (for loop)
Week 9	Loop (while loop)
Week 10	Switch statement
Week 11	Arrays one dimensional
Week 12	Arrays two dimensional
Week 13	Pointer
Week 14	Library function
Week 15	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	Lab 1: Introduction to use Dev C++ ver 5.11 application
Week 2	Lab 2: Introduction of running C++ code.
Week 3	Lab 3: C++ program using variables.
Week 4	Lab 4: C++ program using string.
Week 5	Lab 5: Running Examples of mathematic expression.
Week 6	Lab 6: Examples of If statement.
Week 7	Lab 7: Using for loop.
Week 8	Lab 8: Using while loop.
Week 9	Lab 9: Examples of switch statement.
Week 10	Lab 10: Examples of Arrays one dimensional
Week 11	Lab 11: Examples of Arrays two dimensional
Week 12	Lab 12: Examples of Pointer
Week 13	Lab 13: Examples of Library function
Week 14	Lab 14: Examples of Library function
Week 15	Lab 15: Exam



Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. A Complete Guide to Programming in C++ Ulla Kirch-Prinz Peter Prinz. JONES AND BARTLETT PUBLISHERS.	Yes
Recommended Texts	2. RENTICE HALL, Englewood Cliffs, New Jersey 07632 AT&T Bell Laboratories Murray Hill, New Jersey Brian W. Kernighan • Dennis M. Ritchie Second Edition PROGRAMMING LANGUAGE 3. C PROGRAMMING TUTORIAL	yes
Websites	4. Simply Easy Learning by tutorialspoint.com	

Grading Scheme

مخطط الدرجات

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

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

Program Course Description **Introduction to Computing & Problem Solving**

Code	Name of the Course Unit	Semester	In-Class Hours (T+P)	Credit	ECTS CREDIT
ICNE-101	Introduction to Computing & Problem Solving	1	4	3	8

General Information	
Language of Instruction:	English
Level of the Course Unit:	Bachelor's Degree
Type of the Course:	Compulsory
Mode of Delivery of the Course Unit	Face to Face
Coordinator of the Course Unit	Sazeen Taha
Instructor(s) of the Course Unit	Sazeen Taha



Objectives And Contents	
Objectives of the Course Unit:	**Introduce the students with computer programming techniques using C++ language, and how it can be used to solve problems related to their specialization.**
Contents of the Course Unit:	**To learn the** **1- Introduction to C++.** **2- Operators & Making Decisions** **3- Looping & Arrays** **4- Pointers & Functions.**

Week	Key Learning Outcomes Of The Course Unit On successful completion of this course unit, students/learners will or will be able to dealing with:
1	Introduction to algorithms
2	Introduction to flowcharts
3	Introduction to C++ (Structure of a program)
4	Variables, Data types, Declaration of variables, Scope of variables, Expression and Basic Input /Output.
5	String handling, local and global variables
6	Operator (Assignment ,Arithmetic operator, Increase and decreased)
7	Making decisions (If statement)
8	Loop (for loop)
9	Loop (while loop)
10	Switch statement
11	Arrays one dimensional
12	Arrays two dimensional
13	Pointer
14	Library function
15	Final Exam
No.	**Practical Part**
1	**Lab 1: Introduction to C++ program using visual studio .**
2	**Lab 2: my first program and how solve a problem.**
3	**Lab 3: if...else and switch programs**
4	**Lab 4: while loop and for loop programs**
5	**Lab 5: Bitwise Operators programs**
6	**Lab 6: Single Dimensional arrays**
7	**Lab 7: two Dimensional arrays ..part1**
8	**Lab 8: two Dimensional arrays..part2**



9	Lab 9: Character and String programs
10	Lab 10: how implement a Structure
11	Lab 11: Pointers and arrays
12	Lab 12: Functions.part1
13	Lab 13: Functions.part2
14	Lab 14: Review

WORKLOAD & ECTS CREDITS OF THE COURSE UNIT: Introduction to Computing & Problem Solving ICNE-101			
Workload For Learning & Teaching Activities			
Type of the Learning Activates	Learning Activities (# of week)	Duration (hours, h)	Workload (h)
Lecture & In-Class Activities	15	2	30
Preliminary & Further Study	NA	NA	NA
Land Surveying	NA	NA	NA
Group Work	NA	NA	NA
Laboratory	14	2	28
Reading	NA	NA	NA
Assignment (Homework)	2	2	4
Project Work	NA	NA	NA
Seminar	1	3	3
Internship	NA	NA	NA
Technical Visit	NA	NA	NA
Web Based Learning	NA	NA	NA
Implementation/Application/Practice	NA	NA	NA
Practice at a workplace	NA	NA	NA
Occupational Activity	NA	NA	NA
Social Activity	NA	NA	NA
Thesis Work	NA	NA	NA
Field Study	NA	NA	NA
Report Writing	6	3	18
Final Exam	1	3	3
Preparation for the Final Exam	1	14	14
Mid-Term Exam	1	2	2
Preparation for the Mid-Term Exam	1	9	9
Short Exam (Quizzes)	4	1	4
Preparation for the Short Exam	4	3	12
Total Workload of the Course Unit	51	43	150
Workload (h) / 25			123
ECTS Credits allocated for the Course Unit			8



Module Descriptor Form
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Arabic Language			Module Delivery	
Module Type	Basic			✓ Theory Lecture Lab Tutorial Practical Seminar	
Module Code	NTU-103				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	1		Semester of Delivery	2	
Administering Department	ICNE		College	KTECCAI	
Module Leader	Mohanad Kamal		e-mail	mohanad.kamal25@ntu.edu.iq	
Module Leader's Acad. Title	Assist. Prof.		Module Leader's Qualification	master	
Module Tutor	None		e-mail	None	
Peer Reviewer Name	None		e-mail	None	
Review Committee Approval	1/12/2025		Version Number	1.0	
Relation With Other Modules العلاقة مع المواد الدراسية الأخرى					
Prerequisite module	None		Semester		
Co-requisites module	None		Semester		

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module 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	معرفة القواعد النحوية والصرفية. التعريف بأبرز المصنفات اللغوية والأدبية. تحديد المشكلات اللغوية والأدبية لدى الدارسين. 4- القراءة المعاصرة للنصوص اللغوية والأدبية. قراءة النصوص الأدبية وكتابتها وفق المعايير النحوية والصرفية تعزيز الثقة بالنفس والجرأة والفصاحة المنافسة والتميز في سوق العمل
Indicative Contents المحتويات الإرشادية	مقدمة عن الأصوات اللغوية التاء المربوطة والتاء المفتوحة (4 ساعات) تطبيقات الأصوات اللغوية الشائعة واقسام الكلام (6 ساعات) همزة الوصل والقطع والهمزة المتوسطة والمتطرفة قواعد كتابة الالف الممدودة والمقصورة الحروف الشمسية والقمرية والضياد والظاء (12 ساعة)

المشاكل والمعوقات ونقاشات	(6 ساعات)	

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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	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	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

As		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

Week	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
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.

ARABIC LANGUAGE Program Course Description

CODE	NAME OF THE COURSE UNIT	SEMESTER	IN-CLASS HOURS (T+P)	CREDIT	ECTS CREDIT
NTU103	Arabic Language	2	2	2	2

GENERAL INFORMATION	
Language of Instruction:	Arabic
Level of the Course Unit:	Bachelor's Degree
Type of the Course:	Compulsory
Mode of Delivery of the Course Unit	Face to Face
Coordinator of the Course Unit	mohanad.kamal25@ntu.edu.iq
Instructor(s) of the Course Unit	Mohanned Kamal

OBJECTIVES AND CONTENTS	
Objectives of the Course Unit:	أهداف مادة اللغة العربية : 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 .
Contents of the Course Unit:	ملخص المحتويات : تتلخص المحتويات على مواضيع تمنع الطالب من الوقوع في الاخطاء فضلا عن الكتابة بلغة سليمة.

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Week	KEY LEARNING OUTCOMES OF THE COURSE UNIT On successful completion of this course unit, students will be able to dealing with:
1	مقدمة عن الأخطاء اللغوية
2	التاء المربوطة والتاء المفتوحة
3	همزة الوصل والقطع
4	الهمزة المتوسطة والمتطرفة
5	قواعد كتابة الالف الممدودة والمقصورة
6	الحروف الشمسية والقمرية
7	الضاد والظاء
8	العـــدد
9	المفاعيل
10	أقسام الكلام
11	معاني حروف الجر
12	تطبيقات الأخطاء اللغوية الشائعة
13	النون والتنوين
14	مقدمة عن الأخطاء اللغوية
15	الامتحان النهائي

WORKLOAD & ECTS CREDITS OF THE COURSE UNIT :	NTU103	ARABIC LANGUAGE	
WORKLOAD FOR LEARNING & TEACHING ACTIVITIES			
TYPE OF THE LEARNING ACTIVITES	LEARNING ACTIVITIES (# OF WEEK)	DURATION (HOURS, H)	WORKLOAD (H)
Lecture & In-Class Activities	15	2	30
Preliminary & Further Study			
Land Surveying	NA	NA	NA
Group Work			
Laboratory	NA	NA	NA
Reading	10	1	10
Assignment (Homework)	NA	NA	NA
Project Work			
Seminar	1	1	1
Internship			
Technical Visit	NA	NA	NA
Web Based Learning			
Implementation/Application/Practice	NA	NA	NA
Practice at a workplace			
Occupational Activity	NA	NA	NA
Social Activity			
Thesis Work	NA	NA	NA
Field Study			
Report Writing	1	1	1
Final Exam	1	3	3
Preparation for the Final Exam	1	3	3
Mid-Term Exam	1		
Preparation for the Mid-Term Exam	1	1	1
Short Exam (Quizzes)	1		
Preparation for the Short Exam	1	1	1
TOTAL WORKLOAD OF THE COURSE UNIT	33	13	50
Workload (h) / 25			50÷25
ECTS Credits allocated for the Course Unit			2



MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Computer 1			**Module Delivery**	
Module Type	Core			☒ **Theory** **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	NTU-102				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level	1		**Semester of Delivery**	2	
Administering Department	**ICNE**		**College**	**KTECCAI**	
Module Leader	**Kona Mohammed Thaher**		**e-mail**	**Kona_th@ntu.edu.iq**	
Module Leader's Acad. Title	**Assistant Lecturer**		**Module Leader's Qualification**	**Ms.c**	
Module Tutor			**e-mail**	E-mail	
Peer Reviewer Name			**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**		

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	MATLAB is a widely used programming language and computational

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	tool for numerical analysis, data visualization, and scientific computing. In undergraduate curricula, MATLAB teaching goals include developing students' skills in programming, data analysis, and problem solving, as well as providing them with a practical understanding of mathematical concepts and the analysis of complex computations and algorithms. The most crucial goals for teaching MATLAB include learning outcomes, which include: 1- Introduction to Programming: MATLAB is frequently used in academic curriculum as an introductory programming language. The main goal is to familiarize students with fundamental ideas in programming, including variables, data types, control structures, functions, and algorithms. 2- Numerical Computation: MATLAB is frequently used for numerical computation, and one of the primary objectives of the MATLAB study program is to teach students how to conduct mathematical calculations, work with matrices, solve challenging equations, and put algorithms into practice for scientific, engineering, and mathematical applications. 3- Data Analysis and Visualization: MATLAB offers strong tools for data analysis and visualization. The built-in functions, toolboxes, and simulations of MATLAB are used by students to construct plots and graphs, show data in various forms, and do statistical analysis. 4- Simulation and Modeling: Many simulation and modeling jobs are performed using MATLAB. Students will learn how to create mathematical models, simulate systems, and analyze their behavior by utilizing MATLAB's simulation features. 5- Development of applications: MATLAB enables the creation of standalone programs and GUI-based user interfaces. For their projects and scientific research, students can learn how to write interactive programs, publish MATLAB code as standalone applications, and develop user-friendly interfaces. 6- Development of applications: MATLAB enables the creation of standalone programs and GUI-based user interfaces. For their projects and scientific research, students can learn how to write interactive programs, publish MATLAB code as standalone applications, and develop user-friendly interfaces. 7- Problem-solving abilities are a common topic of MATLAB study programs. Students are encouraged to use their MATLAB and programming expertise to address real-world issues, developing their analytical and critical thinking skills.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	MATLAB is a popular programming language and tool. It has many uses, including biology, engineering, economics, mathematics, data analysis, and complex mathematical equations. As a result, MATLAB learning objectives in undergraduate curricula can change based on the course and level of the student. In academic programs, MATLAB often produces the following learning outcomes: 1- Understanding and Application of Programming Concepts: Students learn the basic structure of the MATLAB programming language, including variables, loops, functions, and conditional statements. They also learn how to write efficient and effective code using best programming practices. 2- Data analysis and visualization using equation solving, engineering diagrams, and visualization are all possible with MATLAB. Students gain knowledge of

	how to use MATLAB functions to import, modify, and analyze data. In order to visualize outcomes, they also learn how to make plots, charts, and graphs. 3- Modeling and Simulation: MATLAB is often used to model and simulate complex systems in engineering, physics, applied science, and other scientific fields. Students learn how to create mathematical models and simulations using MATLAB functions and tools. 4- Solve complex problems: MATLAB is a useful tool for solving complex problems in many fields. Students learn how to use MATLAB to solve problems related to optimization, numerical analysis, and differential and integral equations in advanced mathematics. 5- Interdisciplinary: MATLAB has applications in a wide range of disciplines, including engineering, physics, biology, economics, and mathematics. Students gain knowledge of how to use MATLAB to tackle issues in their particular fields of study. 6- Programming for scientific computing: MATLAB is often used in scientific computing, where efficient and accurate numerical calculations are required. Students learn how to code scientific computing applications using MATLAB's built-in functions and tools to analyze their data. 7- Algorithm development: MATLAB is a useful tool for developing and testing algorithms. Students learn how to develop and test algorithms for various applications using MATLAB. 8- Digital Image and Signal Processing: MATLAB contains built-in functions for processing digital images and signals, which makes it a popular tool in these fields. Students learn how to use MATLAB to analyze and process images and digital signal processors. 9- Machine Learning and Data Science: MATLAB has a variety of tools for machine learning and data science applications, including neural networks, classification algorithms, and data visualization tools. Students learn how to use these tools to solve problems and analyze data in machine learning. 10- Communication and Collaboration: MATLAB is frequently used in joint research projects where a large number of researchers contribute to the same code base. The built-in version control and code sharing facilities in MATLAB help students learn how to cooperate productively. Additionally, they gain communication skills by using MATLAB's visualization and simulation tools to present their findings. 11- Control Systems Design: When it comes to planning and assessing control systems, MATLAB is employed in control systems engineering. Students gain knowledge of how to utilize MATLAB to simulate closed-loop systems, create controllers, and assess system stability. 12- Computational finance: MATLAB has built-in functions for financial modeling and analysis, making it a popular tool in computational finance. Students learn how to use MATLAB to model financial markets, analyze financial data, and develop trading strategies. 13- Numerical methods: MATLAB is a powerful tool for numerical methods, such as solving differential equations, performing numerical integration, and solving optimization problems. Students learn how to use MATLAB to apply numerical methods to solve problems in their respective fields of study.
Indicative Contents	**Indicative content includes the following.**

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المحتويات الإرشادية	**Part A -** Introduction to MATLAB environment & MATLAB windows, MATLAB commands & elementary mathematical functions **[12 hrs]** Vectors and Matrices **[14 hrs]** Solving basic algebraic equations & quadratic equations **[14 hrs]** Create function in files – MATLAB Introduction to Plotting, Plotting multiple plots & Plotting 3D **[14 hrs]** **Part B-** **For-end** loops, **While- end** loops & **If** statement **[14hrs]** Integration, differentiation and Fourier transform **[12 hrs]** Introduction to Simulink and Modeling equations in Simulink **[14 hrs]** Modeling electrical cct. in Simulink, Modeling electronic and communication cct. in Simulink **[14 hrs]**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Learning and teaching strategies are methods used to help learners acquire knowledge and skills, and for teachers to effectively deliver instruction. There are various types of learning and teaching strategies, including: 1- Active learning entails involving students in tasks that demand their participation, critical thinking, and application of what they have learned. Group discussions, practical exercises, and problem-based learning are a few examples. 2- Collaborative learning: This involves group work and collaboration among learners to achieve a common goal. Examples include group projects and peer learning. 3- Inquiry-based learning: This involves encouraging learners to ask questions, explore topics, and find answers through research and experimentation. Examples and reports include scientific investigations and case studies. 4- Direct instruction: This involves the teacher providing information to learners in a structured and organized manner. Examples include lectures, demonstrations, and tutorials. 5- Differentiated instruction: This involves tailoring instruction to meet the needs of individual learners, based on their learning style, abilities, and interests. 6- Technology-based instruction: This involves using technology tools and resources to enhance instruction and engage learners. Examples include online courses, interactive whiteboards, and educational apps. 7- Effective teaching and learning strategies often involve a combination of these approaches, tailored to the needs of the learners and the content being taught.

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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**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**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	20% (10)	7	LO # 1-7
	Final Exam	3hr	40% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to MATLAB environment & MATLAB windows
Week 2	MATLAB commands & elementary mathematical functions
Week 3	Vectors and Matrices
Week 4	Matrices
Week 5	Solving basic algebraic equations & quadratic equations
Week 6	Create function in files - MATLAB
Week 7	Introduction to Plotting, Plotting multiple plots & Plotting 3D
Week 8	Operational & logical Statements
Week 9	**For-end** loops & **While- end** loops
Week 10	**If** statement
Week 11	Integration & differentiation



Week 12	Fourier transform
Week 13	Introduction to Simulink
Week 14	Modeling equations in Simulink
Week 15	Modeling electrical cct. in Simulink
Week 16	Modeling electronic cct. in Simulink

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to MATLAB environment
Week 2	MATLAB windows
Week 3	MATLAB commands & elementary mathematical functions
Week 4	Vectors
Week 5	Matrices
Week 6	Solving basic algebraic equations & quadratic equations
Week 7	Create function in files - MATLAB
Week 8	Introduction to Plotting, Plotting multiple plots & Plotting 3D
Week 9	Operational & logical Statements
Week 10	**For-end** loops & **While- end** loops
Week 11	**If** statement
Week 12	Integration & differentiation
Week 13	Fourier transform
Week 14	Introduction to Simulink and Modeling equations in Simulink
Week 15	Modeling electrical cct. in Simulink
Week 16	Modeling electronic cct in Simulink

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	MATLAB An Introduction with Applications.	
Recommended Texts	An Introduction to Programming and Numerical Methods in MATLAB	
Websites	https://www.mathworks.com	

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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.

Computer Program Course Description

Code	Name of the Course Unit	Semester	In-Class Hours (T+P)	Credit	ECTS CREDIT
NTU102	**Computer 1**	2	4	2	4

General Information	
Language of Instruction:	**English**
Level of the Course Unit:	**Bachelor's Degree**
Type of the Course:	**Compulsory**
Mode of Delivery of the Course Unit	**Face to Face**
Coordinator of the Course Unit	**Hajar Mujeeb Muhammed**
Instructor(s) of the Course Unit	**Hajar Mujeeb Muhammed**

Objectives And Contents	
Objectives of the Course Unit:	Introduce the student to general computer parts.
Contents of the Course Unit:	Computer principles, Computer parts and Windows



Week	Key Learning Outcomes Of The Course Unit On successful completion of this course unit, students/learners will or will be able to dealing with:
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
15th	**Final Exam**

Week	Practical Part
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	Illustrating Start Menu and Windows Accessories
15th	**Final Exam**

COMPUTER NTU102 WORKLOAD & ECTS CREDITS OF THE COURSE UNIT:			
Workload For Learning & Teaching Activities			
Type of the Learning Activities	Learning Activities (# of week)	Duration (hours, h)	Workload (h)
Lecture & In-Class Activities	15	2	30
Preliminary & Further Study	15	1	15
Land Surveying	NA	NA	NA



Group Work	NA	NA	NA
Laboratory	NA	NA	NA
Reading	NA	NA	NA
Assignment (Homework)	4	3	12
Project Work	NA	NA	NA
Seminar	NA	NA	NA
Internship	NA	NA	NA
Technical Visit	NA	NA	NA
Web Based Learning	NA	NA	NA
Implementation/Application/Practice	NA	NA	NA
Practice at a workplace	NA	NA	NA
Occupational Activity	NA	NA	NA
Social Activity	NA	NA	NA
Thesis Work	NA	NA	NA
Field Study	NA	NA	NA
Report Writing	NA	NA	NA
Final Exam	1	4	4
Preparation for the Final Exam	1	6	6
Mid-Term Exam	1	2	2
Preparation for the Mid-Term Exam	1	4	4
Short Exam (Quizzes)	1	2	2
Preparation for the Short Exam	NA	NA	NA
Total Workload of the Course Unit	**39**	**24**	**75**
Workload (h) / 25			**100/25**
ECTS Credits allocated for the Course Unit			**3**



Module Descriptor Form
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Introduction to Computer Network			**Module Delivery**	
Module Type	Core			✓ Theory Lecture ✓ Lab Tutorial Practical Seminar	
Module Code	ICNE-108				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level	1		**Semester of Delivery**	2	
Administering Department	ICNE		**College**	KTECCAI	
Module Leader	Ihsan Hassan Hussain		**e-mail**	Ihsan_hassan@ntu.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Master	
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name	None		**e-mail**	None	
Review Committee Approval	2/12/2025		**Version Number**	1.0	
Relation with Other Modules العلاقة مع المواد الدراسية الأخرى					
Prerequisite module	None			**Semester**	
Co-requisites module	None			**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	To understand network architecture: Learning the different components and layers of computer networks. To analyze network protocols: Studying the various protocols used in computer networks. To exploring network security: Understanding the concepts and techniques related to network security. To investigating network technologies: Exploring various network technologies, such as LANs, WANs, wireless networks. To understanding network services and applications: Studying network services and applications. To enhancing network design and implementation skills: Developing skills in designing and implementing computer networks To examine network management: Learning about network management principles, tools, and techniques.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Understanding Network Concepts Differentiate between LAN (Local Area Network), WAN (Wide Area Network), and MAN (Metropolitan Area Network).



	Explain the purpose and components of the OSI model and the TCP/IP model **Understand the hierarchical structure of the layers in both models** **Explain the different types of transmission media, encoding, modulation and multiplexing techniques used for data transmission** **Analyzing Network Communication** **Compare and contrast different network models, such as the TCP/IP model and the OSI model.** **Applying Network Protocols: understanding how protocols like TCP/IP enable reliable data transmission and how they are used in real-world scenarios.** **Understanding the functions and responsibilities of the data link layer in the OSI model.** **Identify and apply error detection mechanisms, such as checksums or cyclic redundancy checks (CRC).**
Indicative Contents **المحتويات الإرشادية**	Introduction to Computer Networks: [12 h] Definition of computer networks Network architectures and types (LAN, WAN, MAN) Network components and their functions Network protocols and standards Network Models and Protocols: [14 h] OSI (Open Systems Interconnection) model and TCP/IP model Layers of the OSI and TCP/IP models Protocols and services at each layer Encapsulation and de-encapsulation processes Physical Layer: [20 h] Transmission media (copper, fiber-optic, wireless) Data transmission techniques (analog vs. digital, modulation, multiplexing) Signal encoding (NRZ, Manchester, etc.) Switching (circuit, datagram and virtual). Data Link Layer: [12 h] Framing and error detection Flow control and error control mechanisms Media Access Control (MAC) protocols (Ethernet, Wi-Fi) Local Area Networks (LAN) and Ethernet technologies

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. When studying Computer Networks Fundamentals, there are several key strategies that can help you grasp the material effectively. These strategies include (Understanding the Fundamentals, Layered Approach, Analyze Network Protocols, Network Simulations: Visualize Networks and Practical Problem Solving. 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)	**63**	**Structured SWL (h/w)**	**4**

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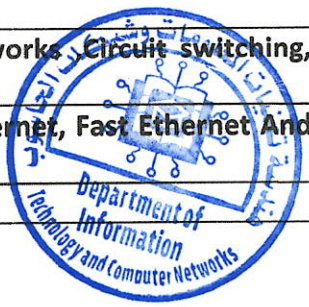
الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	137	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	9
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation
تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	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	5	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

Week	Material Covered
Week 1	Introduction to data communication and networks: Data Representations, Data Flows, and classify the computer networks according to application, size, transmission technology
Week 2	Network Models: Protocol Layering, The ISO reference Model, and TCP/IP Reference Model
Week 3	Connection-Oriented Versus Connectionless Service, and Service Primitives
Week 4	LANs Topologies: CSMA/CD, Token Access protocols, and IP addressing
Week 5	Metropolitan Area Networks, Wide Area Networks, Internetworks, and VPNs
Week 6	performance metrics, Bandwidth, Throughput, Latency (Delay),Bandwidth-Delay, Jitter
Week 7	Digital signals transmission: impairment (attenuation, distortion, noise, data rate limits) Channel capacity and Shannon Formula
Week 8	Bandwidth-Limited Signals, The Maximum Data Rate of a Channel
Week 9	Guided transmission media (twisted-pair cable, coaxial cable, fiber-optic cable), and wireless transmission, transmission modes, Parallel and Serial Transmissions
Week 10	Digital Signals and Digital Transmission: Line Coding Baseband, Passband,
Week 11	Multiplexing and Demultiplexing: FDM,TDM, and CDM
Week 12	Public Switched Telephone Network: Structure of the Telephone System, DSL Trunks and Multiplexing
Week 13	Switching: Circuit and Datagram Networks, Virtual-Circuit Networks, Circuit switching, packet switching & virtual switching
Week 14	Wired LANs:Ethernet Standards, Bridged Ethernet, Switched Ethernet, Fast Ethernet And Gigabit Ethernet
Week 15	Final Exam.



Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	**Lab 1: Introduction to Network Lab**
Week 2	**Lab 2: Network Transmission media**
Week 3	**Lab 3: Cables and LAN tester**
Week 4	**Lab 4: Network Devices 1**
Week 5	**Lab 5: Network Devices 2**
Week 6	**Lab 6: Peer-to-peer Network**
Week 7	**Lab 7: Building LAN Network using Hub 1**
Week 8	**Lab 8: Building LAN Network using Hub 2**
Week 9	**Lab 9: Network Tools**
Week 10	**Lab 10: Network commands 1**
Week 11	**Lab 11: Network commands 2**
Week 12	**Lab 12: Introduction to Internet Protocol (IP)**
Week 13	**Lab 13: IP addressing 1**
Week 14	**Lab 14: IP addressing 2**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Behrouz A. Forouzan. Data communication and Networking, fifth edition	Yes
Recommended Texts	Michael Duck and Richard Read" Communications and Computer Networks, 2nd edition, Pearson Education 2003	No
Websites	Digital Systems: From Logic Gates to Processors: https://www.coursera.org/learn/computes networks	



Introduction To Computer Network Program Course Description

Code	Name of the Course Unit	Semester	In-Class Hours (T+P)	Credit	ECTS CREDIT
ICNE-108	**Introduction to Computer Network**	2	4	2	8

General Information	
Language of Instruction:	**English**
Level of the Course Unit:	**Bachelor's Degree**
Type of the Course:	**Compulsory**
Mode of Delivery of the Course Unit	**Face to Face**
Coordinator of the Course Unit	**Ihsan Hassan Husain**
Instructor(s) of the Course Unit	**Ihsan Hassan Husain**

Objectives And Contents	
Objectives of the Course Unit:	Introduce the student to general Networks fundamentals.
Contents of the Course Unit:	Network principles and applications

Week	**Key Learning Outcomes Of The Course Unit** **On successful completion of this course unit, students/learners will or will be able to dealing with:**
1	Introduction to data communication and networks:
2	Data Representations, Data Flows, and classify the computer networks according to application, size, transmission technology
3	Network Models:
4	Protocol Layering, The ISO reference Model, and TCP/IP Reference Model
5	Connection-Oriented Versus Connectionless Service, and Service Primitives
6	LANs Topologies:
7	CSMA/CD, Token Access protocols, and IP addressing



8	Metropolitan Area Networks, Wide Area Networks, Internetworks, and VPNs
9	performance metrics, Bandwidth, Throughput, Latency (Delay),Bandwidth-Delay, Jitter
10	Digital signals transmission:
11	impairment (attenuation, distortion, noise, data rate limits)
12	Channel capacity and Shannon Formula
13	Bandwidth-Limited Signals, The Maximum Data Rate of a Channel
14	Guided transmission media (twisted-pair cable, coaxial cable, fiber-optic cable), and wireless transmission, transmission modes, Parallel and Serial Transmissions
15	**Final Exam**

Introduction to Computer Network **ICNE-108** **WORKLOAD & ECTS CREDITS OF THE COURSE UNIT:**

Workload For Learning & Teaching Activities			
Type of the Learning Activities	Learning Activities (# of week)	Duration (hours, h)	Workload (h)
Lecture & In-Class Activities	15	2	30
Preliminary & Further Study	15	2	30
Land Surveying	NA	NA	NA
Group Work	NA	NA	NA
Laboratory	NA	NA	NA
Reading	NA	NA	NA
Assignment (Homework)	4	10	40
Project Work	NA	NA	NA
Seminar	NA	NA	NA
Internship	NA	NA	NA
Technical Visit	NA	NA	NA
Web Based Learning	NA	NA	NA
Implementation/Application/Practice	NA	NA	NA



Practice at a workplace	NA	NA	NA
Occupational Activity	NA	NA	NA
Social Activity	NA	NA	NA
Thesis Work	NA	NA	NA
Field Study	NA	NA	NA
Report Writing	NA	NA	NA
Final Exam	1	3	3
Preparation for the Final Exam	1	6	6
Mid-Term Exam	1	2	2
Preparation for the Mid-Term Exam	1	4	4
Short Exam (Quizzes)	1	10	10
Preparation for the Short Exam	NA	NA	NA
Total Workload of the Course Unit	**39**	**39**	**125**
Workload (h) / 25			**125/25**
ECTS Credits allocated for the Course Unit			**5**



MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	AC Circuit Analysis			Module Delivery	
Module Type	Basic			✓ Theory Lecture ✓ Lab Tutorial Practical Seminar	
Module Code	ICNE-107				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	1		Semester of Delivery	2	
Administering Department	**ICNE**		**College**	**KTECCAI**	
Module Leader	Dr.Ali Mardan		e-mail	ali.qutub@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	1/12/2025		Version Number	1.0	

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	DC Circuit Analysis	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-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	1-Knowledge Acquisition: Students will acquire a comprehensive understanding of the fundamental concepts and principles of alternating current (AC) circuits.

مخرجات التعلم للمادة الدراسية	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

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	performance to help them identify areas for improvement.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	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

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	5% (10)	5,7 ,10	LO #1, 2, 10 and 11
	Assignments	3	5% (10)	2,9 ,12	LO # 3, 4, 6 and 7
	Lab.(mid pract.)	2	10%(30)	Continuous	All
	Projects	3	5% (10)	2,9 ,12	LO # 3, 4, 6 and 7
	Report	6	10% (10)	Continuous	All
	Seminars	3	5% (10)	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)		

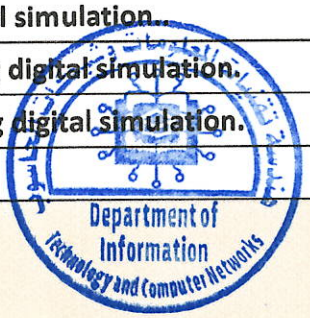
Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

Week	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.

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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	
Week	**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.

Program Course Description **AC Circuits Analysis**

Code	Name of the Course Unit	Semester	In-Class Hours (T+P)	Credit	ECTS CREDIT
ICNE-107	AC Circuit Analysis	2	2+2	3	6

General Information	
Language of Instruction:	English
Level of the Course Unit:	Bachelor's Degree
Type of the Course:	Compulsory
Mode of Delivery of the Course Unit	Face to Face
Coordinator of the Course Unit	DR. Ali Mardan
Instructor(s) of the Course Unit	Dr.Ali Mardan

Objectives And Contents	
Objectives of the Course Unit:	• To teach the fundamental concept of AC single & 3-phase electrical circuits. • To teach fundamentals of Electric Circuits, their components and the mathematical Tools used to represent and analyze AC electrical circuits

	including resistors, capacitors, and inductors, dependent and independent sources.
Contents of the Course Unit:	1 – Inductance & Capacitance in Electric circuits. 2 – Alternating Quantities. 3 – Single-phase AC Circuits. 4 – Power in AC Circuits. 5 – Three-Phase Circuit Analysis.

Week	Key Learning Outcomes Of The Course Unit On successful completion of this course unit, students/learners will or will be able to dealing with:
1	**Inductance & Capacitance in Electric circuits. -1** General concept of capacitance (charge and voltage, capacitors in series and parallel) -1 General concept of inductance (inductive and non-inductive circuits, capacitors in series and parallel) -2
2	**2- Alternating Quantities.** Ac systems, waveforms, terms and definitions.
3	**2- Alternating Quantities.** Average and R.M.S values of current and voltage.
4	**2- Alternating Quantities.** Phasor diagram
5	**3- Single - phase of AC Circuits.** AC in resistive circuits, current and voltage in inductive circuits, current and voltage in capacitive circuits.
6	**3- Single - phase of AC Circuits.** Concept of complex impedance and admittance, AC series and parallel circuits.
7	**3- Single - phase of AC Circuits.** RL , RC and RLC circuit analysis and phasor representation.
8	**4- Power in AC circuits.** Power in resistive circuits, power in inductive and capacitive circuits, power in circuit with resistance and reactance.
9	**4- Power in AC circuits.** Power factor, its practical importance, improvement of power factor, measurement of power in a single – phase AC circuits.
10	**5- Three – phase circuit analysis.** Basic concept and advantages of three – phase circuit.
11	**5- Three – phase circuit analysis.** Phasor representation of star and delta connection.
12	**5- Three – phase circuit analysis.** Phase and line quantities.
13	**5- Three – phase circuit analysis.** Voltage and current computation in 3-phase balance and unbalance circuits.
14	**5- Three – phase circuit analysis.** Real and Reactive power computation, measurement of power and power factor in 3-phase system.
15	**Final Exam.**



No.	Practical Part
1	**Lab 1:** Measurement amplitude, frequency and time with oscilloscope using hardware and digital simulation.
	Lab 2: Examine phase relation in RL & RC circuit using hardware and digital simulation.
2	**Lab 3:** Calculate & verify average and RMS value,
3	**Lab 4**: Impedance of series RL and RC circuit using digital simulation.
4	**Lab 5:** Impedance of series RLC circuit using digital simulation.
5	**Lab 6:** Determination of average value, RMS value, form factor, peak factor of sinusoidal wave using digital simulation.
6	**Lab 7:** Measure currents and voltages in three-phase balanced AC circuits
7	**Lab 8:** Prove Y-Δ transformation,
	Lab 9: Exercise on phasor diagrams for three-phase circuits.
8	**Lab 10:** Measurement of voltage, current& power in a three-phase circuit.
9	**Lab 11:** Ohm's LAW, KVL AND KCL in AC circuits using digital simulation.
10	**Lab 12:** Determination of mesh currents in AC circuits using digital simulation.
11	**Lab 13:** Measurement of nodal voltages in AC circuits using digital simulation.
14	**Lab 14:** Review

AC Circuit AnalysisAIK125	**Workload & ECTS Credits of The Course Unit :**		
Workload For Learning & Teaching Activities			
Type of the Learning Activates	Learning Activities (# of week)	Duration (hours, h)	Workload (h)
Lecture & In-Class Activities	15	2	30
Preliminary & Further Study	2	2	4
Land Surveying	NA	NA	NA
Group Work	NA	NA	NA
Laboratory	14	2	28
Reading	NA	NA	NA
Assignment (Homework)	2	1	2
Project Work	NA	NA	NA
Seminar	2	1	2
Internship	NA	NA	NA
Technical Visit	NA	NA	NA
Web Based Learning	2	2	4
Implementation/Application/Practice	NA	NA	NA
Practice at a workplace	NA	NA	NA
Occupational Activity	NA	NA	NA
Social Activity	NA	NA	NA
Thesis Work	NA	NA	NA
Field Study	NA	NA	NA
Report Writing	6	2	12
Final Exam	1	3	3
Preparation for the Final Exam	1	20	20
Mid-Term Exam	1	2	2
Preparation for the Mid-Term Exam	1	12	12
Short Exam (Quizzes)	3	0.5	1.5

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Preparation for the Short Exam	3	1.5	4.5
Total Workload of the Course Unit	**53**	**51**	**125**
Workload (h) / 25			**125/25**
ECTS Credits allocated for the Course Unit			**5**



MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Physics			Module Delivery	
Module Type	Basic			☒ Theory Lecture Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CAIK-100				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	1		Semester of Delivery	2	
Administering Department	**ICNE**		**College**	**KTECCAI**	
Module Leader	Sawach Sami Mohammed		e-mail	Sawach_Sami@ntu.edu.iq	
Module Leader's Acad. Title	Assistant Lecturer		Module Leader's Qualification	Ms.c	
Module Tutor			e-mail	E-mail	
Peer Reviewer Name			e-mail	E-mail	
Scientific Committee Approval Date			Version Number		

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The objectives of the subject of electrical and electronic physics in university and college curricula typically include the following: It aims to provide students with a solid foundation in the basic principles and concepts of electrical and electronic physics. It covers topics such as electric fields, magnetic fields, electromagnetic waves, and semiconductor physics. The aim is to ensure that students have a clear understanding of the basic principles that govern electrical and electronic phenomena. Develop students' analytical and problem-solving skills. By studying electrical and electronic physics, students learn to apply mathematical techniques and tools to analyze and solve engineering problems. They become adept at using formulas, equations, and mathematical models to understand and predict the behavior of electrical and electronic circuits and devices. Introducing students to the design and analysis of electrical and electronic circuits. Students learn how to apply the principles of electrical and electronic physics to design circuits for specific applications. They gain knowledge of circuit components, such as resistors, capacitors, inductors, and transistors, and learn how to combine them to create functional circuits.

	Practical Application: This subject aims to bridge the gap between theory and practice by providing students with practical experience. Laboratory work is an integral part of electrical and electronic physics courses, allowing students to apply theoretical concepts to real-world scenarios. They learn to use laboratory equipment, conduct experiments, and perform measurements to verify theoretical predictions and deepen their understanding of electrical and electronic phenomena. Preparation for advanced studies: Electrical and electronic physics serves as a basis for more advanced courses in electrical engineering or related fields. The aim of this subject is to prepare students for further studies by providing them with the necessary knowledge and skills. This includes providing the conceptual framework and problem-solving capabilities that will be necessary to address advanced topics and applications in areas such as power systems, communications, control systems, and electronic devices. Develop students' ability to communicate and present their ideas clearly and effectively. Through assignments, reports, and presentations, students learn to express their understanding of electrical and electronic physics, explain complex concepts, and present their findings in a concise and structured manner
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Specific learning outcomes in electrical and electronic physics can vary depending on the institution, course level (undergraduate or graduate), and curriculum. Through this, it is possible to provide a general set of learning outcomes that are usually associated with the study of electrical and electronic physics in universities, colleges and institutes: Understanding of Basic Principles: Gain a comprehensive understanding of the basic principles and laws that govern electrical and electronic phenomena. This includes concepts related to electric fields, magnetic fields, electromagnetic waves, and semiconductor physics. Develop strong analytical and problem-solving skills, enabling the ability to apply mathematical techniques and tools to analyze and solve electrical and electronic engineering problems. This involves using mathematical formulas, equations, and models to understand and predict the behavior of electrical circuits and devices. Gain the necessary knowledge and skills to design and analyze electrical and electronic circuits. This includes selecting appropriate components, understanding circuit behavior under various conditions, and being able to create circuits that meet specific requirements and constraints. Gain hands-on experience through laboratory work, including conducting experiments, making measurements, and analyzing data. Develop proficiency in using laboratory equipment and techniques to verify theoretical predictions and deepen understanding of electrical and electronic phenomena. Familiarity with electrical and electronic components and devices and develop a working knowledge of electrical components and devices commonly used in electrical engineering. This includes understanding the properties and behavior of resistors, capacitors, inductors, transistors, diodes, and other basic electronic components. Apply the principles of electrical and electronic physics to real-world engineering problems and applications. This includes understanding how electrical and electronic concepts are used in areas such as power systems,

	communications, control systems, and electronic devices. Communication and Presentation Skills: Develop effective communication and presentation skills, both written and oral, for technical information related to electrical and electronic physics. This includes the ability to articulate understanding, explain complex concepts, and present results in a clear and structured manner.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A – * Introduction to materials science and engineering, Energy levels, Atomic structure and Polymer [12 hrs.] * Electrical source voltage and current, Types of impedances, their characteristics and methods of connection [12hrs] * Semiconductors Fundamentals, Extrinsic Semiconductors [8 hrs.] Part B- * The P-N Junction, The P-N Junction diode, diode application [10 hrs.] * Type of diode (Zener diode, Light Emitting Diodes, Tunnel Diode) [10 hrs.] * Transistor, Bipolar transistor biasing, field effect transistor FET [10 hrs.]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Learning and teaching techniques are tools used by teachers to provide instruction successfully and by learners to acquire knowledge and skills. There are many different kinds of teaching and learning techniques, such as: 1. Engaging students in activities that require their participation, critical thinking, and application of what they have learned is active learning. Examples include case studies, hands-on activities, and problem-based learning. 2- Collaborative learning: This type of learning involves students working together in groups to accomplish a common goal. Peer learning and group projects are two examples. 3. Inquiry-based learning: This entails motivating students to pose queries, investigate subjects, and discover solutions via study and experimentation. Scientific research and case studies are examples and reports. 4- Direct instruction: In this method, the teacher presents knowledge to the students in a planned and systematic way. Examples include tutorials, lectures, and shows. 5- Differentiated instruction: This refers to adjusting instruction to fit the needs of certain students depending on their interests, learning preferences, and learning styles. 6- Technology-based instruction: This method involves enhancing instruction and involving students by using technology tools and resources. Online classes, interactive whiteboards, and instructional apps are a few examples. 7- Effective teaching and learning tactics frequently combine these methods in ways that are suited to the needs of the students and the subject matter being covered.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1

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Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50

Module Evaluation
تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	20% (10)	7	LO # 1-7
	Final Exam	3hr	40% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

Week	Material Covered
Week 1-2	Introduction to materials science and engineering, Energy levels, Atomic structure and Polymer
Week 3-4	Internal structure of cell, Resistance of Material and resistivity
Week 5-6	Electrical source voltage, current Types of impedances, their characteristics and methods of connection
Week 7-8	Semiconductors Fundamentals, Extrinsic Semiconductors
Week 9-10	The P-N Junction, The P-N Junction diode, diode application
Week 11-12	Type of diode (Zener diode, Light Emitting Diodes, Tunnel Diode)
Week 13-14-15	Transistor, Biploar transistor biasing, field effect transistor FET

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		
Recommended Texts	-Electronic devices - Thomas L. Floyd, -Electronic devices and Circuits - Jimme J. Cathy- second edition	yes
Websites		

Grading Scheme
مخطط الدرجات

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



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

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

PHYSICS Program Course Description

CODE	NAME OF THE COURSE UNIT	SEMESTER	IN-CLASS HOURS (T+P)	CREDIT	ECTS CREDIT
CAIK100	**Physics**	2	2	2	2

GENERAL INFORMATION	
Language of Instruction:	**English**
Level of the Course Unit:	**Bachelor's Degree**
Type of the Course:	**Compulsory**
Mode of Delivery of the Course Unit	**Face to Face**
Coordinator of the Course Unit	**Swash Sami Mohammed**
Instructor(s) of the Course Unit	**Swash Sami Mohammed**

OBJECTIVES AND CONTENTS	
Objectives of the Course Unit:	The objectives of the subject of physics in university and college include the following: 1- It aims to provide students with a solid foundation in the basic principles and concepts of electrical and electronic physics. 2- Develop students' analytical and problem-solving skills. By studying electrical and electronic physics, students learn to apply mathematical techniques and tools to analyze and solve engineering problems.
Contents of the Course Unit:	**Indicative content includes the following.** **Part A –** * Introduction to materials science and engineering, Energy levels, atomic structure and Polymer **[12 hrs.]** * Electrical source voltage and current, Types of impedances, their characteristics and methods of connection **[12hrs]** * Semiconductors Fundamentals, Extrinsic Semiconductors **[8 hrs.]** **Part B-** * The P-N Junction, The P-N Junction diode, diode application **[10 hrs.]** * Type of diode (Zener diode, Light Emitting Diodes, Tunnel Diode) **[10 hrs.]** * Transistor, Bipolar transistor biasing, field effect transistor FET **[10 hrs.]**

Week	KEY LEARNING OUTCOMES OF THE COURSE UNIT On successful completion of this course unit, students/learners will or will be able to dealing with:
Week 1-2	Introduction to materials science and engineering, Energy levels, atomic structure and Polymer
Week 3-4	Internal structure of cell, Resistance of Material and resistivity.
Week 5-6	Electrical source voltage, current Types of impedances, their characteristics and methods of connection.
Week 7-8	Semiconductors Fundamentals, Extrinsic Semiconductors.



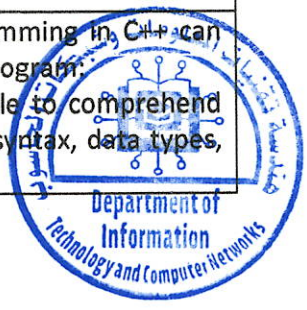
Week 9-10	The P-N Junction, The P-N Junction diode, diode application.
Week 11-12	Type of diode (Zener diode, Light Emitting Diodes, Tunnel Diode).
Week 13	Transistor, Bipolar, transistor biasing, field effect transistor FET.
Week 14	Review
15	**Final Exam**

Module Descriptor Form
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Programming Language			Module Delivery	
Module Type	Core			✓ Theory Lecture ✓ Lab Tutorial Practical Seminar	
Module Code	ICNE-106				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level	1		Semester of Delivery	2	
Administering Department	**ICNE**		**College**	**KTECCAI**	
Module Leader	Suzeen Taha		e-mail	sazeentaha4@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	1/12/2025		Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module 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 Outcomes مخرجات التعلم للمادة الدراسية	The learning outcomes for a module on computer programming in C++ can vary depending 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	123	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	8
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم المادة الدراسية				
As	Time/Number	Weight (Marks)	Week Due	Relevant Learning

					Outcome
Formative assessment	Quizzes	4	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	6	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	5	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	
Week	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	
Week	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.

ProgrammingLanguage Program Course Description

Code	Name of the Course Unit	Semester	In-Class Hours (T+P)	Credit	ECTS CREDIT
ICNE-106	**Programming Language**	2	2+2	4	8

General Information	
Language of Instruction:	**English**
Level of the Course Unit:	**Bachelor's Degree**
Type of the Course:	**Compulsory**
Mode of Delivery of the Course Unit	**Face to Face**
Coordinator of the Course Unit	**Sazeen Taha**



Instructor(s) of the Course Unit	**Sazeen Taha**

Objectives And Contents	
Objectives of the Course Unit:	Introduce the students with computer programming techniques using C++ language, and how it can be used to solve problems related to their specialization.

Veek	Key Learning Outcomes Of The Course Unit ssful completion of this course unit, students/learners will or will be able to dealing with:
1	**Arithmetic operators, Compound assignment, Increase and decrease, Relational and equality operators, Conditional operator)**
2	**Making Decisions (if...else and switch).**
3	**Looping (while loop and for loop).**
4	**Bitwise Operators and Explicit type casting operator**
5	**Structure**
6	**Reference operator, dereference operator, Declaring variables of pointer types,)**
7	**Arrays (Single Dimensional arrays, Arrays as parameters)**
8	**Arrays (two Dimensional arrays, Arrays as parameters)**
9	**Character Sequences and String handling.**
10	**Structure**
11	**(Reference operator, dereference operator, Declaring variables of pointer types,)**
12	**pointers and arrays, Pointers to pointers, void pointers and Pointers to functions**
13	**Local and global variables, Arguments passed by value and by reference, Default values in parameters)**
14	**Overloaded functions and Recursive functions.**
15	Revision

WEEK	**Practical Part**
1	**Lab 1:** two Dimensional arrays … Problem-solving… part1
2	**Lab 2:** two Dimensional arrays ... Problem-solving… part2
3	**Lab 3:** Character and String programs
4	**Lab 4:** Statements (switch, break, go to) …part1
5	**Lab 5:** Statements (switch, break, go to) …part2
6	**Lab 6:** how implement a Structure… part2
7	**Lab 7:** Pointers and arrays… part1
8	**Lab 8:** Pointers and arrays… part2
9	**Lab 9:** Functions...part1



10	**Lab 10:** Functions...part2
11	**Lab 11:** Functions...part3
12	**Lab 12:** Header and name space programs
13	**Lab 13:** Introduction to Classes programs
14	**Lab 14**: Review

WORKLOAD & ECTS CREDITS OF THE COURSE UNIT : ProgrammingLanguage ICNE-106			
Workload For Learning & Teaching Activities			
Type of the Learning Activates	Learning Activities (# of week)	Duration (hours, h)	Workload (h)
Lecture & In-Class Activities	**15**	**2**	**30**
Preliminary & Further Study	NA	NA	NA
Land Surveying	NA	NA	NA
Group Work	NA	NA	NA
Laboratory	**14**	**2**	**28**
Reading	NA	NA	NA
Assignment (Homework)	2	2	4
Project Work	NA	NA	NA
Seminar	**1**	**3**	**3**
Internship	NA	NA	NA
Technical Visit	NA	NA	NA
Web Based Learning	NA	NA	NA
Implementation/Application/Practice	NA	NA	NA
Practice at a workplace	NA	NA	NA
Occupational Activity	NA	NA	NA
Social Activity	NA	NA	NA
Thesis Work	NA	NA	NA
Field Study	NA	NA	NA
Report Writing	6	3	18
Final Exam	1	3	3
Preparation for the Final Exam	1	14	14
Mid-Term Exam	1	2	2
Preparation for the Mid-Term Exam	1	9	9
Short Exam (Quizzes)	4		
Preparation for the Short Exam	4	3	12
Total Workload of the Course Unit	**51**	**43**	**125**
Workload (h) / 25			**125/25**
ECTS Credits allocated for the Course Unit			**5**

