MODULE DESCRIPTION FORM

Module Information					
Module Title	Digital Logic			**Module Delivery**	
Module Type	**Core**				
Module Code	**IT102**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	UG1		**Semester of Delivery**	1	
Administering Department	Information Technology		**College**	College of Science	
Module Leader	Nabeel Sadiq Abdel Abbas		**e-mail**	nabeel@uowa.edu.iq	
Module Leader's Acad. Title	Assistant Lecturer		**Module Leader's Qualification**	Mcs	
Module Tutor	Nabeel Sadiq Abdel Abbas		**e-mail**	nabeel@uowa.edu.iq	
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Scientific Committee Approval Date	2024-11-01		**Version Number**	1.0	

Relation with other Modules			
Prerequisite module	-	**Semester**	-
Co-requisites module	-	**Semester**	-

Department Head Approval

Dean of the College Approval

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	1. Provide students with basic information about digital logic and logic circuits. 2. Increasing students' horizons in the fields of computer science and digital development. 3. Developing the students' English language by teaching the subject in English. 4. Providing students with applied and experimental skills through practical subjects and laboratories. 5. Familiarize students with the latest developments in the fields of different sciences and the technology emanating from them. 6. Developing the student's ability to research and providing him with scientific research contexts. 7. Develop students' ability to analyze and link information and conclusion. 8. Enhancing the scientific spirit in the interpretation of phenomena, discussion, and dialogue. 9. Consolidation of conviction in the integration of sciences and their universality towards the truth. 10. Working on refining the student's personality and discovering his inclinations and talents through scientific and cultural activities. 11. Enhancing the spirit of teamwork through the participation of students in laboratory work or the completion of joint scientific research. Establish values and ideals Higher among them is respect for instructions, discipline, respect for the institution to which the student belongs, and preservation of its property.
Module Learning Outcomes	1. Knowing the numerical number systems used in logical circuits and performing arithmetic operations on them. 2. Knowledge of logical circuits and their design methods. 3. Simplify logic circuits by simplifying their equations. 4. Full knowledge of digital meters, dividers, and other electronic circuits. 5. Full knowledge of the use of signs and their representation in binary numbers. 6. Full knowledge of how to convert between number systems used in numerical operations. 7. How to integrate digital portals together and methods of calculating their outputs. 8. Design counters and dividers and link them together
Indicative Contents	1. Introduction to Digital Logic and Logic Circuits ● Overview of digital logic and its significance in computer science and digital development ● Introduction to logic circuits and their role in processing digital information 2. Logic Gates and Circuit Design ● Exploration of fundamental logic gates (AND, OR, NOT, XOR, NAND, NOR) ● Designing and analyzing logic circuits using gates ● Application of De Morgan's theorem for circuit simplification 3. Combinational Logic Circuits ● Understanding the design and operation of combinational logic circuits

	● Implementation of multiplexers, demultiplexers, encoders, and decoders ● Building adders, subtractors, and comparators 4. Sequential Logic Circuits ● Introduction to sequential logic circuits and their behavior ● Study of flip-flops and latches for storing and transferring data ● Analysis and design of synchronous and asynchronous sequential circuits 5. Digital Integrated Circuits ● Types and characteristics of digital integrated circuits (TTL, CMOS, FPGA) ● Understanding IC packaging, pin configurations, and datasheets ● Testing, troubleshooting, and selecting appropriate ICs for specific applications. 6. Practical Applications and Research Focus ● Hands-on experiments in laboratory settings to apply learned concepts. ● Exploring emerging trends and advancements in digital logic and circuits ● Developing research skills and methodologies for investigating digital systems

Learning and Teaching Strategies	
Strategies	● Giving lectures ● Performing software tasks in laboratories ● Scientific discussions and dialogues and asking questions. ● The completion of tasks by student work teams in the laboratory

Student Workload (SWL)			
Structured SWL (h/sem)	60	**Structured SWL (h/w)**	5
Unstructured SWL (h/sem)	87	**Unstructured SWL (h/w)**	6
Total SWL (h/sem)	**147 + 3 (Final Exam) = 150**		

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

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Numbers system
Week 2	Binary, BCD, octal, Hex Numbers
Week 3	Converting Binary Arithmetic
Week 4	1's and 2's Complements of Binary Numbers Signed Numbers
Week 5	Logic Gate
Week 6	Boolean Algebra and Logic Simplification
Week 7	DE Morgan's Theorem
Week 8	Karnaugh Map
Week 9	Combinational Logic Circuit
Week 10	Functions of Combinational Logic
Week 11	Latches
Week 12	Flip-Flops
Week 13	Counters
Week 14	Counters
Week 15	Multiplexer and demultiplexer

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	Introduction to Digital Logic and Logic Gates
Week 2	Logic Gates and Truth Tables
Week 3	Logic Gate Implementations

Week 4	Combinational Logic Circuits
Week 5	Multiplexers and Demultiplexers
Week 6	Encoders and Decoders
Week 7	Sequential Logic Circuits: Latches and Flip-Flops
Week 8	Sequential Logic Circuits: Counters
Week 9	Shift Registers
Week 10	Memory Units: RAM and ROM
Week 11	Introduction to Programmable Logic Devices
Week 12	Number Systems: Binary, Decimal, and Hexadecimal
Week 13	Number System Conversions
Week 14	Arithmetic Circuits: Adders and Subtractors
Week 15	Digital Logic Design Project

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	Digital Logic & Number System (Munich war Gulati & Mini) Gulati)	yes
Recommended Texts	Digital logic and computer design (Morris-Mano) 4th ed.	NO
Websites		

Grading Scheme				
Group	**Grade**	**Mark**	**Marks %**	**Definition**
Success Group (50 - 100)	**A -** Excellent	Excellent	90 - 100	Outstanding Performance
	B - Very Good	Very Good	80 - 89	Above average with some errors
	C - Good	Good	70 - 79	Sound work with notable errors
	D - Satisfactory	Fair / Average	60 - 69	Fair but with major shortcomings
	E - Sufficient	Pass / Acceptable	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	Fail (Pending)	(45-49)	More work required but credit awarded
	F – Fail	Fail	(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.