Jordan University of Science and Technology
Faculty of Computer & Information Technology
Artifcial Intelligence Department

AI275 Digital Logic Design And Computer Organization - JNQF Level: 7
First Semester 2023-2024

Course Catalog
3 Credit Hours. 3 Credit Hours. Binary systems; Boolean algebra and logic gates; Simplification of Boolean functions; Combinational logic; Design of combinational logic and hierarchical logic design; Sequential logic; Registers, ALU design, Computer Architecture MARIE and ISA.

Text Book	
Title	The Essentials of Computer Organization and Architecture
Author(s)	Linda Null, PhD; Julia Lobur
Edition	5th Edition
Short Name	Ref #1
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref #2	Digital design with an Introduction to the Verilog HDL	M. Morris Mano and Michael D. Ciletti	5th Edition	

Instructor	
Name	**Prof. Yahya Tashtoush**
Office Location	A1L3
Office Hours	Sun : 09:30 - 10:30 Sun : 12:30 - 14:30 Tue : 12:30 - 13:30 Wed : 08:30 - 09:30 Thu : 11:30 - 12:30
Email	yahya-t@just.edu.jo

Class Schedule & Room

Section 1:
  Lecture Time: Sun, Tue, Thu : 10:30 - 11:30
  Room: A3131

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Weeks 1, 2	Introduction, History, Concepts, Overview	From **Ref #1**
Weeks 3, 4	Binary System, Number Base Conversions. Arithmetic Operation with different Bases Complements. Signed Binary Numbers, Binary Logic and Logic Gates: AND, OR and NOT.	**ch2** From **Ref #1**, **ch1** From **Ref #2**
Weeks 5, 6	Data Representation in Computer Systems	**ch2** From **Ref #2**
Weeks 7, 8, 9	Boolean Algebra and Digital Logic, Combinational logic, Sequential Circuits: analysis and design	**ch3** From **Ref #1**
Weeks 10, 11, 12	MARIE: An Introduction to a Simple Computer, Instruction Set Architecture	**ch4** From **Ref #1**
Weeks 13, 14	ALU Design and organization	From **Ref #1**, From **Ref #2**
Weeks 15, 16	Project Discussion	

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Be able to explain how the various data types are represented in binary form and how they can be used to provide reliability in data transmission and recording [1SO1] [1L7S2]	10%	First Exam
Be able to understand the MIPS instruction set and be able to write simple program using it and translate it to machine instructions. [1SO1] [1L7S2]	10%	First Exam
Be able to, to use switching algebra theorems to solve problems [1SO1] [1L7S2]	10%	First Exam
Be able to use various techniques to optimize logic realization [1SO2] [1L7S2]	30%	Second Exam
Be able to identify the fundamental building blocks of computer circuits, understand the role and operation of the basic component modules, and describe how they can be combined to create the essential components necessary to build a functioning computer system [1SO6] [1L7S2]	20%	Final Exam

Be able to describe the organization and design of a basic digital computer [1SO6] [1L7S2]	20%	Final Exam

Relationship to Program Student Outcomes (Out of 100%)					
SO1	SO2	SO3	SO4	SO5	SO6
30	30				40

Relationship to NQF Outcomes (Out of 100%)
L7S2
100

Evaluation	
Assessment Tool	Weight
First Exam	30%
Second Exam	30%
Final Exam	40%

Policy	
Attendance	Attendance will be recorded at the beginning of each class, and missing 20% of the classes results in automatic dismissal (No excuses). If a student misses a class, it is his sole responsibility to catchup.
Exams	No books or notes are allowed in the exams or quizzes. The exams and quizzes format may include multiple choice, but the most common is problem solving, analysis and design.
Makeups	Exam makeup requires online application within two days of the announced date, pending formal approval, makeups are arranged by the faculty for all courses in one day, typically one week after the exams period end.
Cheating	Copying assignments and cheating by any means in the exams and quizzes results in sever penalty.

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