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Project Title: Modernization of Teaching Methodologies in Higher Education: Eu Experience For Jordan And Palestinian Territory

Project acronym: METHODS

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Deliverable title	Course Outline		
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Project co-ordinator name, title and organisation:

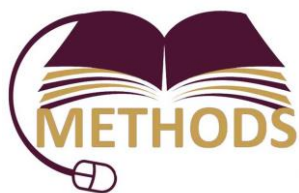
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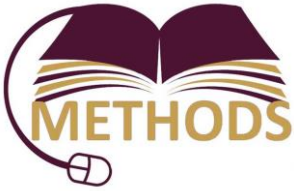
Birzeit University University Name

**Faculty of Engineering and Technology/ Electrical and Computer Engineering
Department**

Course title/code	Digital Design	ENCS2344
Instructor /office	Abdellatif Abu-Issa	TEC214
Semester- Year	First Semester 2017/2018	
Compulsory/Elective	Compulsory	
Prerequisites	COMP230 – Computer and Programming	

Course Description	This course covers the basics of Digital Logic Design. The course starts with introduction Binary Numbers and Number Systems and how to convert between them. Then it covers the main postulates of Boolean Algebra. Then it introduces the main Logic gates. Also it covers the design of logic circuits (both combinational and sequential).
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Generic Competences*	<ul style="list-style-type: none">• To familiarize students with the basic concepts of digital systems, the hardware base of many modern devices including computers.• To study number systems and conversion between different bases and binary codes.• To study basic logic gates and use them to implement Boolean functions.• To study combinational circuit analysis and design.• To study sequential circuit analysis and design.• To introduce students to error detection and correction techniques.• To learn how to implement combinational circuits using Programmable devices such as ROM, PAL and PLA.
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Specific Competences (SCs)	<ol style="list-style-type: none">1. Ability to apply mathematics, science and engineering principles.2. Ability to design a system, component, or process to meet desired needs.3. Ability to identify, formulate and solve engineering problems.
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- These competences related also to the project Methods

	Course contents	SC1	SC2	SC3
1	Number Systems and Binary Numbers	x		
2	Boolean Algebra and logic Gates	x		
3	Gate Level Minimization	x		x
4	Combinational Logic		x	x
5	Synchronous Sequential Logic		x	x
6	Registers and Counters		x	x
7	Memory and Programmable Logic	x		x

Schedule				
Week	Subject	Activity Description *	Evaluation Criterion	
			Description	%
1	Digital Systems & Binary Numbers, Number base conversions, Octal and Hexadecimal, Complements, signed binary numbers, binary codes, and binary logic.	Inverted Classroom	Quiz1 at the end of the class	3%
2	Axiomatic definition and basic theorems of Boolean Algebra.			
3	Canonical forms, other logic operations, digital logic gates, integrated circuits.	MOOC		
4	Map method (2, 3, 4, 5) variable map method	MOOC + PBL	Quiz2 at the beginning of the class	3%
5	Product of sum, don't cares, NAND and NOR implementations. Other two level implementations, XOR function,	MOOC + Inverted Classroom	Quiz3 at the beginning of the class	3%
6	Combinational circuits, Analysis and design procedure, binary adder subtractor, decimal adder, binary Multiplier.			
7	Magnitude comparator, Decoders, Encoders, Multiplexers	MOOC + PBL	Quiz4 at the end of the class	3%
8	Sequential circuits, Latches. Latches, flip-flops.		Midterm Exam	30%
9	Analysis of clocked sequential	MOOC		

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	circuits, synthesizable			
10	State reduction, design procedure, Implication table.	MOOC		
11	Synchronous counters and Circuits	PBL		
12	Ripple counters	PBL	Quiz5 at the end of the class	3%
13	Registers, shift registers, and other counters	Inverted Classroom		
14	Programmable Logic	MOOC + Inverted Classroom		
15	Error Correction and Correction	MOOC + PBL	Project Discussion	5%
16			Final Exam	40%

* PBL, MOOC, Inverted Classroom should be introduced within activity description

Textbook and References	<i>Digital Design</i> by Morris Mano, 5 th Edition, Prentice Hall, 2012	
Overall Assessment Criteria	Method	Weight [%]
	Attendance / participation	
	Quizzes	15
	Midterm	30
	Project	5
	Assignments	10
	Final Exam	40