



# Course Weekly Outline

**Course Name: Digital Electronics**

<b>Course Instructor</b>	Hussam Jasim Ali				
<b>E-mail</b>	hssjali@uoanbar.edu.iq				
<b>Title</b>	Assistant Lecturer				
<b>Course Coordinator</b>					
<b>Course Objective</b>	After the students complete the course they will be able to realize the digital system principles, design, simplify, and analyze combinational logic circuits, and also Design and analyze sequential logic circuits, counters, and shifting logic circuits.				
<b>Course Description</b>					
<b>Textbook</b>	Digital Electronics Principles, Devices and Applications (Anil K. Maini)				
<b>References</b>	Digital electronics : principles, devices, and applications / Anil Kumar Maini. ISBN 978-0-470-03214-5				
<b>Course Assessments</b>	Term Tests	Laboratory	Quizzes	Project	Final Exam
	30	15	5		50
<b>General Notes</b>	-				



## Course Weekly Outline

Week	Date	Topics Covered	Lab. Experiment Assignments	Notes
1		Analog ,Digital, Analog vs Digital, Electronics Components (Resistor, Diode, Transistor, Capacitor, Relay, Led), Number systems (decimal, binary, octal, hexadecimal) , Logic gates (AND, OR, NOT, NAND, NOR, XOR, XNOR), Binary Codes (Binary Coded Decimal, Gray Code, Alphanumeric Codes), Logic Families	Define Logic gates	
2		Boolean, Demorgan's theorem , Simplification Techniques	Design	
3		Karnaugh maps (2-variables, 3-variables, 4-variables)	Design	
4		Arithmetic operations (adder, parallel binary adder, Subtractor, decoder, encoder, multiplexer, DEMultiplexer, comparator, cod, conversion)	Implement Arithmetic Circuits	
5		Arithmetic operations (adder, parallel binary adder, Subtractor, decoder, encoder, multiplexer, DEMultiplexer, comparator, cod, conversion)	Implement Arithmetic Circuits	
6		Flip-flops (SR latch, D latch, T-latch, J-K F.F, edge triggered, conversion from one type to another)	Implement Circuits	
7		Counters (asynchronous, synchronous, decade, up/down, cascade, counter decoding)	Implement Counters	
8		Counters (asynchronous, synchronous, decade, up/down, cascade, counter decoding)	Implement Counters	
9		Shift-registers (serial in/serial out, serial in/parallel out, parallel in/serial out, parallel in/parallel out, bidirectional , shift register counter (Johnson counter, Ring counter))	Implement Counters	
10		Multivibrators (definition, astable, bistable, monostable, 555 timer)	Design Timer	
11		A / D and D/A convertors (R /2 R DAC, R/2n R DAC, flash ADC, tacking ADC, slope ADC, successive approximation ADC, digital ramp ADC, delta sigma ADC)	Design Converter	
12		A / D and D/A convertors (R /2 R DAC, R/2n R DAC, flash ADC, tacking ADC, slope ADC, successive approximation ADC, digital ramp ADC, delta sigma ADC)	Design Converter	
13		Microcontrollers atmega , introduction to arduino		
14		Arduino programming		
15		Arduino programming		

Instructor Signature: Hussam Jasim Ali

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