Hashemite University
College of Engineering
Department of Mechatronics
Digital Logic and Digital Electronics 110405322
(3 Credit Hours)[1]

Instructor

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Office hours:	10:00 am – 11:00 am. Sun, Tues

Grading info

First	**25**	Tuesday 19/2
Second	**25**	Tuesday 9/4
Quizzes	**10**	
Final	**40**	

Class Info

Days	Sun Tues Th**u**
Time	9:00– 10:00
Location	E2024

Course

Course Number:	**110405322**
Prerequisite:	Electronics 1 **(110406329)**
Textbook:	Floyd, T.L, Digital Fundamentals, Tenth Edition
Course Description (as in the catalog):	Boolean Algebra and Design of logic circuits. Adders and subtractors BCD, Binary detectors and encoders, Flip-flops. Shift registers, ROM, RAM, Transistors as switching devices, RTL, TTL, and CMOS logic circuits. TTL and CMOS characteristics. A/D and D/A circuits
Specific Outcomes of Instruction (Course Outcomes):	The student shall be able to: 1. Understand Number Systems, Arithmetic Operations and Boolean Algebra. (a) 2. Understand Karnough Map, Simplification and Manipulation. Concept of Minterms and Maxterms. (e) 3. Design and analyse combinational Logic, Decoders, and Multiplexers. (c, e) 4. Understand Binary Adders/ Subtractors: Half, Full and Ripple Carry Adders. (a, e) 5. Design and analyze Sequential Logic Circuits; Latches, Flip-Flops, Registers and Counters. (a, c) 6. Understand Diodes and Transistors as Switches and types of amplifiers. (h)
Important material	-

References:

1. Nigle P. Gook, Introductory Digital Electronics, Prentice-Hall International, Inc, 1998.
2. J.R. Nowicki, and L.J Adam, Digital Circuits, Routldge and Hall, Inc, 1990.
3. H.V. Malmstadt, Digital Electronics for Scientists, W.A. Benjamin Inc.

Major Topics Covered and Schedule in Weeks:

Topic	# Weeks	# Contact hours
1. Introduction to Number Systems, Arithmetic Operations and Boolean Algebra.	1	3
2. Karnough Map, Simplification and Manipulation. Concept of Minterms and Maxterms.	2,3	6
3. Combinational Logic Design, Design and Analysis Procedure for Decoders, Encoders, Multiplexers.	4,5,6	9
4. Binary Adders/ Subtractors: Half, Full and Ripple Carry Adders.	7	3
5. Sequential Logic Circuits; Design and Analysis Procedures for Latches, Flip-Flops, Registers and Counters.	8.9.10	9
6. Programmable Logic Arrays, Read Only Memory.	11	3
7. Diodes and Transistors as Switches and types of amplifiers.	12	3
8. Simple Concept of Diode and Diode-Transistor Logic Gates (DTL)	13	3
9. Evolution of (DTL) Gates and Transistor-Transistor Logic Gates (TTL) Gates.	14	3
10. Direct-Coupled Emitter-Follower Logic.	15	3
Total	**15**	**45**

Course Policy

- **Attendance**: Anyone who has more than five class-long, unexcused absences will receive an "F" grade for the COURSE.

[1] 1st Semester (2018-2019)

Student Outcomes (SO) Addressed by the Course:

#	*Outcome Description*	*Contribution*
(a)	an ability to apply knowledge of mathematics, science, and engineering	***M***
(b)	an ability to design and conduct experiments, as well as to analyze and interpret data	
(c)	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	***M***
(d)	an ability to function on multidisciplinary teams	
(e)	an ability to identify, formulate, and solve engineering problems	***M***
(f)	an understanding of professional and ethical responsibility	
(g)	an ability to communicate effectively	
(h)	the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	***L***
(i)	a recognition of the need for, and an ability to engage in life-long learning	
(j)	a knowledge of contemporary issues	
(k)	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	

H=High, **M**= Medium, **L**=Low