Hashemite University
College of Engineering
Department of Electrical Engineering
EE 343-Digital Electronics (3 Credit Hours/Dept. Compulsory)

Instructor		**Grading info**		**Class Info/ Section**		
Dr. Rula Tawalbeh		Midterm exam (monitored)	30	1 Days		Sun-Wed (MS teams)
Email:		Quizzes (Oral, pop-up)	15	Time		18:30-19:45
		Multisim Project, (simulation, report & discussion)	15	Location		Eng. 2009
Office:	Eng. 3068 (MS Teams)	Final (in class room)	40			
Office hours:	(MS Teams)					

Course	
Course Number:	1104094343
Prerequisite:	Electronics 1 (110409240), covering Semiconductors, Diodes and applications, BJT and their DC circuit analysis and MOSFET with DC analysis. Digital Logic (110408220) Covering Boolean algebra, Logic gates, and logic equivalent circuits, flip-flops and RAMs and ROMs.
Textbook:	"Digital Integrated Circuits" by Thomas A. DeMassa and Zack Ciccone, John Wiley and Sons 1996.
Course Description:	This course aims to provide students with an overview of the design of digital electronic circuits. It will cover diodes, BJT's, Bipolar digital circuits, RTL, DTL, TTL, STTL, ECL, MOSFET, MOS digital circuits, Resistor loaded NMOS inverter, CMOS inverter. In addition, RAM's, ROMs, Schmitt trigger, ADC, DAC.
Specific Outcomes of Instruction (Course Learning Outcomes):	1. Interpret important concepts in Digital Electronics, such as the VTC curve, Fan-out, Fan-in, transition width, time delay and power dissipation (a, c, e). 2. Utilize knowledge in diodes, BJTs and MOSFETs to analyze and design different kinds of digital logic circuits (a, c, e). 3. Apply different methods to analyze digital logic circuits (a, e). 4. Identify, analyze and design different digital logic circuits, such as RTL, DTL, TTL, STTL, MECL, N-MOSFET, PMOSFET and CMOSFET. (c, e) 5. Understanding the operation of digital to analog converters and analog to digital converters. (c, e) 6. Learning the principle of operation of various digital logic circuits, such as Schmitt Triggers, Monostable Multivibrator, ROM and RAM (a, e) 7. Introduction to the latest productions of technology in digital electronics (e)
Important material	Lecture notes, References, Internet resources and software package such as multisim

References:

- **"Microelectronics: Circuit Analysis and Design",** by Donald Neamen 4th edition, McGraw-Hill, 2010.

Major Topics Covered and Schedule in Weeks:

Topic	# Weeks	# Contact hours*
Simple logic circuits such as DRL and RTLs	1	6
DTL.	0.5	3
TTL and STTL	1	6
ECL	0.5	3
N-MOS, P-MOS logic circuits	1.5	9
CMOS gates.	1	6
RAM and ROM	0.5	3
DAC and ADC	0.5	3
Multivibrators and 555 timer	0.5	3
Schmitt Trigger and application	0.5	3
Total	**7.5**	**45**

Course Policy

- Makeup exams will be only held if a student provides a valid excuse, otherwise he/she will receive 0/100.
- Cheating and plagiarism are completely prohibited.
- If a student misses more than 15% of he/she will automatically fail the class.
- Students are not allowed to enter classroom after class starts.

Student Outcomes (SO) Addressed by the Course:		
#	***Outcome Description***	***Contribution***
	General Engineering Student Outcomes	
(a)	An ability to apply knowledge of mathematics, science, and engineering	***H***
(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	***H***
(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	
(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		