

# Philadelphia University

Faculty of Engineering and Technology Communications and Elecs. Engineering Department Second Semester 2021/2022

# **Course Details:**

Title:	Digital Electronics (0650344), Third Year.		
<b>Credit Hours:</b>	3-credit hours (16 weeks per semester, approximately 45 contact		
	hours).		
Class Time:	11:15- 12:45 Sun, Tues.		
<b>Text Book:</b> Digital Integrated Circuits., by Thomas A. DeMass			
	Ciccone, John wiley and Sons. Latest version.		
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, Schmitt trigger, ADC, DAC.		
Website:	http://www.philadelphia.edu.jo/academics/jghaeb/		
	Prof. Jasim Ghaeb,		
Instructor	Email: jghaeb@philadelphia.edu.jo		
111511 uct01.	Office: Mechatronic building, Room 6407, ext: 2304.		

# **Course Outlines:**

Week	Basic and support material to be covered
(1)	PN junction, BJT.
(2)	Ebers-Moll Model, BJT models of operations, MOS transistor.
(3)	Analog and digital signals, delay times.
(4)	RTL, DTL.
(5)	TTL, ECL.
(6)	N-channel D-MOSFET, N-channel E-MOSFET.
(7)	Modes of operations, NMOS Inverter.
(8)	CMOS inverter.
(9)	Wave forms, Rectangular waveform.
(10)	Multivibrators, Bistable.
(11)	Monostable, Astable.
(12)	Problem solving and applications.

(13)	Quantization, Quabntiztion procedure, Applications.	
(14)	Analoge to digital converetrs, Circuits, applications.	
(15)	Digital to analoge convertes, Circuits, applications.	
(16)	Simulating of power electronic circuits with Simulink-MATLAB.	

# <u>Course Learning Outcomes with reference to ABET Student</u> <u>Outcomes:</u>

Upon successful completion of this course, the student should:

1.	1. Understand the fundamentals of semiconductor devices.	
2.	Study the applications of analoge and digital cicuits.	[1]
3.	Investigate the circuit design different of different electronic circuits.	[6]

#### Assessment Guidance:

Evaluation of the student performance during the semester (total final mark) will be conducted according to the following activities:

Sub-Exams:	The students will be subjected to at least one exam during the semester.		
Quizzes:	will be conducted during the semester. The materials of the quizzes are set		
	by the lecturer.		
Homework and	Homework and MATLAB simulation should be solved individually and		
Projects:	submitted at the required time. Students may be assigned to present project(s).		
Final Exam:	The students will undergo a scheduled final exam at the end of the semester		

covering the whole materials taught in the course.

# **Grading policy:**

Quizzes, Projects or Homeworks	30%
Mid Exam	30%
Final Exam	40%
Total:	100%

#### **Attendance policy:**

The semester has in total 45 credit hours. Total absence hours from classes must not exceed 15% of the total credit hours. Exceeding this limit without a medical or emergency excuse approved by the deanship will prohibit the student from sitting the final exam and a zero mark will be recorded for the course.

#### **Student Outcomes**

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

3. an ability to communicate effectively with a range of audiences.

4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.