Philadelphia University

Faculty of Engineering – Department of Communications and Electronics Engineering

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Course Information

Title:	Digital Electronics (0650344)
Prerequisite:	Digital Logic (630211) & Electronics-1 (650242)
Credit Hours:	3 credit hours (16 weeks per semester, approximately 44 contact hours)
Textbook:	Sedra /Smith, "Microelectronic Circuits", 6th edition, 2011, Oxford University Press
References:	1- Donald A. Neamen, "Microelectronics; Circuit Analysis and Design", 4th edition, 2010, McGraw-Hill .
	2- Digital Electronics, D. C. Green, 5th edition.
Catalog Description:	The course introduces the fundamental principles of various digital devices both discrete components and integrated components that find application in digital electronics. To study the characteristics and circuit diagrams of different digital families such as TTL, ECL & MOSFETS. To apply the digital electronics components and ICs in the implementation of different communication circuits and systems.

Course Topics

Week	Topic
1&2	Digital signals and systems, pulse waveforms, switching circuits, pulse distortion, RC circuits.
3	Switching devices, diodes and transistors as switching devices, analysis of switching circuits and switching times.
4	Logic technologies and families, digital terminology.
5,6	TTL family, TTL loading rules, totem pole, open collector and tri-state.
7	ECL family.
8,9	MOS technology, operation and types, MOS inverter, MOS NAND, MOS NOR.
10,11	NMOS, PMOS, CMOS, dynamic MOS, CMOS transmission circuits.`
12,13	MOS memory elements and types, programmable logic devices
14	Interfacing, TTL driving CMOS, flip-flops, multivibraters, monostables, astables, Schmitt trigger, bistables, 555 IC timer,
15	Analog to digital converter and digital to analog converter.
16	Review, and final exam

Course Learning Outcomes and Relation to ABET Student Outcomes:

Upon successful completion of this course, a student should be able to:

1.	Understand the operation and the structure of switching circuits.	[a]
2.	Use of diodes and transistors as switching circuits.	[e]
3.	Design and construct different logic families such as TTL, ECL, and MOSFET	[c, e]
4.	Design, organize, and use the memory element	[c, h]
5.	Understand the operation of multivibraters circuits: monostables, bistables, a stable and 555.	[e]
6.	Convert analog signals to digital signals and vice versa	[a , c, e]
7.	Understand and design electronic circuits for signal conversion	[a , c, e]

Assessment Instruments:

Evaluation of students' performance (final grade) will be based on the following categories:

Exams: Two written exams will be given. Each will cover about 3-weeks of lectures

Quizzes: 10-minute quizzes will be given to the students during the semester. These quizzes will cover material discussed during the previous lecture(s).

Homework: Problem sets will be given to students. Homework should be solved individually and submitted before the due date and to design project that will be given to the students using SPICE.

Copying homework is forbidden, any student caught copying the homework or any part of the homework will receive zero mark for that homework

Participation: Questions will be asked during lecture and the student is assessed based on his/her response

Final Exam: The final exam will cover all the class material.

Grading policy:

First Exam	20%	
Second Exam	20%	
Homework and Projects	10%	
Quizzes	10%	
Final Exam	40%	
Total:	100%	

Attendance policy:

Absence from classes and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse, acceptable to and approved by the Dean of the relevant college/faculty, shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

February, 2017