MKT 2141
Analog Electronics

Term	2018-2019 Fall
Time	G1(%30): Tue-12:00/14:00 (A503) G1(%30): Tue -11:00/12:00 (A506/A504) ---------- *G2(%100): Thursday-13:00/15:00 (A503)* *G2(%100): Thursday-15:00/16:00 (A406-503)*
Lecturer	Assoc.Prof. Dr. Erhan AKDOĞAN
E-Mail	eakdogan50@gmail.com
	www.erhanakdogan.com
	@dr_akdogan
Tel	0 212 383 29 62
Room	E2 Block-217
Office Hours	Tuesday: 11:00-12:00

Course Objectives:

This course covers the design, construction, and debugging of analog electronic circuits. The main contents are: the basic principles of operation, terminal characteristics, and equivalent circuit models for diodes and transistors. Design and analysis of DC-AC Characteristics of transistor circuits. Analysis of operational amplifier (OP-AMP) basics. Frequency response of amplifiers and gain-bandwidth considerations. Includes weekly laboratory about simulation.

Prerequisite:

MKT1132- Introduction to Electric Circuits

Required knowledge:

Familiarity with basic circuit knowledge.

Calendar (Tentative):

Ses.#	Topics	Chapter	Key Dates
1	Introduction of the course, basic electric measurement, electrical currents and their effects on the human body	Lec. Notes	
2	Semiconductor diodes	Chp.1	
3	Diode Applications	Chp.2	
4	**B**ipolar **J**unction **T**ransistors (BJT) physics	Chp.3	
5	DC Biasing -BJTs	Chp.4	
6	BJT AC Analysis	Chp.5	
7	BJT AC Analysis	Chp.5	
8	1st Midterm		
9	Ideal OPAMPs and their applications	Lec. Notes	
10	**F**ield-**E**ffect **T**ransistors	Chp.6	
11	FET Biasing (DC Analysis)	Chp.7	
12	FET Amplifiers (AC Analysis)	Chp.8	
13	Design and analysis of cascade amplifiers	Chp.8	
14	BJT and FET Frequency Response	Chp.9	
15	BJT and FET Frequency Response	Chp.9	
16	Final Exam		

Textbook(s):

Robert L. Boylestad and Louis Nashelsky, *Electronic Devices and Circuit Theory*, 10th edition, Pearson International, 2008.

Robert L. Boylestad and Louis Nashelsky, *Elektronik Cihazlar ve Devre Teorisi*, (Türkçe Çeviri), Palme Yayıncılık, 2012.

Related MATLAB/Simulink Books

Teaching Assistant:

Namık Zengin,
Room: E2-103
namikzengin@gmail.com

Links:

Course web page:

http://ytubiomechatronics.com/courses/

Mail group:

analogelectronic-1819@googlegroups.com

Grading:

Activities	Quantity	Percentages %
Midterms	1	30
Quiz	3÷5	20
HWs	5	10
Final Exam	1	40

Additional Information

Engineers are required to practice "continuous" or "life-long" learning. This course will cover a lot of material which will require the students to do a lot of self-study, reading of the textbooks and handouts, learning how to use equipment and software, etc…

Although the instructor and the TAs are committed to help the students in this course, the students are also expected to take initiatives and to get used to this notion of self-study that will be anyway (i) expected form them in their future careers and (ii) imperative to their success and survival in the real engineering and academic worlds.

On Thursday, last lesson is for practical and simulation studies. Some days we will in the class and some days we will in the computer lab.

The MATLAB will be used for simulation applications. **YTU has MATLAB Licence. All students can download MATLAB to own computers**. Please take information about that from YTU-Bilgi İşlem Merkezi.

Please don't hesitate to ask if you have any question or concern about the course.

Note:

The instructor reserves the right to make changes to this syllabus as necessary.

Course Learning Outcomes

After successfully studying MKT2141, students will be able to:

1. Describe the operation of fundamental semiconductor devices
2. Analyze diode circuits using various large and small signal models
3. Obtain small AC and large DC BJT device models through nonlinear characteristics curves
4. Analyze several common BJT amplifiers using AC and DC equivalent models
5. Classify FET devices and derive DC and AC equivalent models using nonlinear device characteristics
6. Analyze several common JFET, D-MOS and E-MOS amplifiers using AC and DC equivalent models
7. Analyze frequency response of transistors.
8. Analyze OPAMP circuits using ideal models
9. Simulate analog electronic circuits using modern tools