

İSTANBUL KÜLTÜR UNIVERSITY

DEPARTMENT OF ELECTRONIC ENGINEERING



COURSE INFORMATION

2007-2008

<i>Course Code</i>	EE 320	<i>Course Title</i>	Electronic Circuits I		
<i>Course Instructor</i>	Prof.Dr. Aydın AKAN				
<i>E-mail</i>	akan@istanbul.edu.tr	<i>Tel</i>	212 473 70 70 / 17914		
<i>Level/Year</i>	Second	<i>Credits</i>	3-0-0	<i>Semester</i>	3
<i>Course / Lab Assistant</i>	Res. Asst. Güray GÜRKAN				
<i>E-mail</i>	g.gurkan@iku.edu.tr	<i>Tel</i>	212 498 42 30		

Course Homepage

<http://web.iku.edu.tr/courses/ee/ee320/>

Course Description

This is the first course on electronic circuits and systems. Topics include semiconductor materials, energy levels, extrinsic materials, *n* and *p* type materials. Ideal diode, semiconductor diode, zener breakdown, diode equivalent circuits, diode applications, diode load line analysis, zener diode applications. LEDs, bipolar junction transistor, bipolar junction transistor biasing, field effect transistors, field effect transistor biasing, MOSFETs, MOSFET biasing.

Bipolar junction transistor modeling. The r_e transistor modeling. The hybrid equivalent model. Bipolar junction transistor small signal analysis, common-emitter fixed bias, voltage divider bias, emitter-follower configuration, common-base configuration, collector feedback configuration. Field effect transistor small signal analysis. MOSFET amplifier, Effect of R_S and R_L , system approach, Cascade connection, Frequency response of amplifiers. Operational amplifiers and their applications.

Course Aims and Objectives

To give an introduction to

- Semiconductor electronic components, (diode, BJT, FET MOSFET),
- DC biasing of electronic components,
- Small signal modelling and analysis of electronic circuits,
- Analysis and design of single and multi-stage electronic amplifiers,
- Modern approach to electronic circuit analysis by using computer tools: PSPICE, etc.

Learning Outcomes

Understanding and using

- Semiconductor electronic circuit components
- Designing consumer electronic devices using semiconductor electronic components

Methods of Teaching/Learning

The course will be delivered by means of

- Lectures in the class,
- Analytical and computer homework assignments,
- Small design projects.

Prerequisites

--

Methods of Assessment and Weighting

<i>Components of Assessment</i>	<i>Method(s)</i>	<i>Percentage weighting</i>	<i>Date</i>	<i>Length</i>
Assignments	Homework	10 %	Every other week	2 hours
Short quiz	In class	10 %	Twice	15 minutes
Midterm I	Written exam	20 %	20.11.2007	120 minutes

Midterm II	Written exam	20 %	18.12.2007	120 minutes
Final Exam	Written exam	40 %	8.01.2008	120 minutes
Attendance	70 % attendance to class is required to be able to enter the final exam			

Outline Teaching Schedule

The course will be delivered according to the following schedule:

Week 1: Introduction to semiconductor materials, energy levels, n and p type materials.

Week 2: Ideal diode, semiconductor diode, diode load line analysis, diode equivalent circuits, diode applications.

Week 2: Zener diode, breakdown, zener diode applications. LEDs,

Week 3: Bipolar junction transistor (BJT),

Week 4: Bipolar junction transistor biasing,

Week 5: DC bias analysis of BJT's

Week 6: Field effect transistors, field effect transistor biasing,

Week 7: MOSFETs, MOSFET biasing.

Week 8: Midterm I

Week 9: BJT modeling. The hybrid equivalent model. BJT small signal analysis, common-emitter fixed bias, voltage divider bias, emitter-follower configuration, common-base configuration, collector feedback configuration.

Week 10: Field effect transistor small signal analysis. MOSFET amplifier.

Week 11: Cascade connection, Frequency response of amplifiers.

Week 12: Midterm II

Week 13: Operational amplifiers and their applications.

Week 14: Review of the course and problem session.

Textbook/Reference Material/Other Support material

R. Boylestad, and L. Nashelsky, *Electronic Devices and Circuit Theory*, Prentice Hall.