Course Code: EE 320
Course Title: Electronic Circuits I
Course Instructor: Prof. Dr. Aydin AKAN
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Tel: 212 473 70 70 / 17914
Level/Year: Second
Credits: 3-0-0
Semester: 3
Course / Lab Assistant: Res. Asst. Güray GÜRKAN
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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.

**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**

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**Methods of Assessment and Weighting**

<table>
<thead>
<tr>
<th>Components of Assessment</th>
<th>Method(s)</th>
<th>Percentage weighting</th>
<th>Date</th>
<th>Length</th>
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</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>Homework</td>
<td>10 %</td>
<td>Every other week</td>
<td>2 hours</td>
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<tr>
<td>Short quiz</td>
<td>In class</td>
<td>10 %</td>
<td>Twice</td>
<td>15 minutes</td>
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<tr>
<td>Midterm I</td>
<td>Written exam</td>
<td>20 %</td>
<td>20.11.2007</td>
<td>120 minutes</td>
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<tr>
<td>Course</td>
<td>Type</td>
<td>Weight</td>
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<td>Duration</td>
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<tr>
<td>Midterm II</td>
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<tr>
<td>Final Exam</td>
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**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**