FUNDAMENTALS OF ELECTRICAL ENGINEERING
METU EE209 - FALL 2023

Instructor (Section 2): Emre Tuna; E113

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Scope: This course aims to expose the student to the basic circuit components, i.e., the building blocks of electrical circuits. Standard analysis techniques to study linear resistive circuits and dynamic circuits in sinusoidal steady state are covered.

Prerequisite: Basic knowledge of linear algebra is assumed.

Reference Book: C. K. Alexander & M.N. Sadiku. *Fundamentals of Electric Circuits.* McGraw-Hill Book Company, 2016.

Evaluation: There will be two midterm exams (the first in the 7th week, the second in the 12th week; both during class hours) and one final exam.

Tentative course outline:

I. *Basic concepts*

- Definitions
- Kirchhoff's Laws
- Circuit components

II. *LTI resistive circuits*

- Node voltage analysis
- Mesh current analysis
- Thevenin and Norton equivalent circuits
- Maximum power transfer

III. *Operational amplifiers*

- Description of OP-AMP device
- Basic OP-AMP circuits

IV. *First-order circuits*

- LTI RC circuit
- LTI RL circuit

V. *Circuits in sinusoidal steady state*

- Phasors
- Power calculations