

SABANCI UNIVERSITY
Faculty of Engineering & Natural Sciences
ENS203 – Electronic Circuits I
Summer 2023/2024 Syllabus

Instructor

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Office Hours: TBD

Zoom Link: <https://sabanciuniv.zoom.us/j/9757380583>

Zoom Meeting ID: 975 738 0583

Class Schedule

Type	Time	Days	Where	Date Range
Class	2:40 pm - 5:30 pm	M	Fac. of Engin. and Nat. Sci. L029	Jul 08, 2024 - Aug 23, 2024
Class	2:40 pm - 5:30 pm	T	Fac. of Engin. and Nat. Sci. L029	Jul 08, 2024 - Aug 23, 2024

Textbook: Allan R. Hambley. Electrical Engineering: Principles & Applications.

Course Content: Basic Circuit Analysis using Kirchhoff's voltage and current (KVL & KCL) laws, Thevenin and Norton Equivalent Circuits, Passive components, First-order RL and RC circuits, Second-order RLC circuits, Phasors, Frequency response, Bode plot, Series and parallel resonance, operational amplifiers and their applications, active filters, diodes, wave shaping circuits.

Learning Outcomes:

- To apply basic principles of circuit design through KVL and KCL circuit laws to any circuits problem.
- To apply node voltage and/or mesh current analysis methods to analyze circuits.
- To learn the concepts of Thevenin and Norton Equivalent Circuits and apply these to simplify complex circuits.
- To be familiar with first order differential equations and solving first order circuits such as RC and RL circuits.
- Understand sinusoidal steady state analysis, phasors and apply these concepts to analyze first and second-order circuits.
- To learn the concepts of frequency response and bode plot, and apply these concepts to sinusoidal circuits

- To learn the concept of amplification, be able to design operational amplifier-based circuits.
- To learn the concept of diodes and apply this knowledge to design wave shaping circuits.

Tentative Course Schedule:

Week 1: Introduction, KCL, KVL, Series / Parallel Resistive Circuits, Voltage and Current Dividers

Week 2: Node Voltage Analysis, Mesh Current Analysis, Thevenin and Norton Equivalent Circuits, Superposition

Week 3: Capacitors, Inductors, First-order RC / RL Circuits, Steady State, Second-order Circuits (RLC Circuits), Series RLC, Parallel RLC

Midterm 1

Week 4: Phasors, Frequency Response, Transfer Function

Week 5: Bode Plot, First-order Filters, Series Resonance, Parallel Resonance, Second-order Filters

Midterm 2

Week 6: Amplifiers, Instrumentation Amplifier, Integrator, Differentiator, Active Filters

Week 7: Diodes, Wave Shaping Circuits

Course Policies:

- Attendance is extremely important. Top Hat application will be used to take attendance.
- Cheating will not be tolerated.
- For homework no late submission is accepted.
- There will be random quizzes during the lectures and recitations. Their date will not be announced. So, you need to attend all lectures and recitations not to miss any points from quizzes.

Grading Policy:

Midterm 1	25%
Midterm 2	25%
Final	35%
Quizzes	8%
Homework	5%
Attendance	2%

Important Notes:

- In case of an online or hybrid education, your webcam and microphone should be on during the exams. In the case of non-compliance with this and other declared exam procedures, your exam will be void. Make sure to check that your webcam and microphone function properly before the exam.
- You may be given an oral exam to check the authenticity of the written exam by going through the questions of the written exam.
- You must attend the synchronous Zoom lectures, recitations, etc. and real-time online exams with your SU email account in case of an online or hybrid education.