School of Engineering and Natural Sciences / Computer Engineering (English)

2023 - 2024 Academic Year

ELECTRONICS II

Syllabus

Course Description					
Name	**Code**	**Semester**	**T+A Hour**	**Credit**	**ECTS**
ELECTRONICS II	COE3234070	Spring Semester	3+2	4	8

Prerequisites Courses	ELEKTRONİK I
Recommended Elective Courses	
Language of Instruction	English
Course Level	First Cycle (Bachelor's Degree)
Course Type	Elective
Course Coordinator	Assist.Prof. Mustafa AKTAN
Name of Lecturer(s)	Assist.Prof. Mustafa AKTAN
Assistant(s)	
Aim	The purpose of this class is to cover the semiconductor theory, learning the circuit components and the use of these components in applications. Frequency response, feedback theory, stability and basic opamp design concepts will be discussed in this course.
Course Content	This course contains; IntroductionReview of Diode and Transistor physics.Review of basic amplifiers,Review of biasingReview of DC characteristics of OPAMPs.,Introduction to Frequency ResponseIntroduction to Cadence,Frequency Response of Integrated Circuits,Bode plotsTime-constant methods,Pole-zero calculation,Feedback techniques for Integrated Circuits,Review and assessments.,Stability & Frequency Compensation,Stability & Frequency Compensation,Practical Feedback & Loading,Opamp design.,Opamp design.,PROJECT PRESENTATIONS and FINAL REVIEW.

Course Learning Outcomes	Teaching Methods	Assessment Methods
Understanding amplifiers and solving for DC response.	10, 12, 13, 14, 16, 19, 21, 6, 9	A, E, F
Understanding the frequency response of the ICs.	10, 12, 14, 16, 19, 2, 20, 21, 5, 6, 9	A, E, F
Pole-zero calculation and understanding time constant methods.	10, 12, 13, 14, 16, 19, 20, 23, 4, 5, 6, 9	A, E, F
Understading feedback techniques for ICs.	10, 12, 13, 14, 17, 19, 23, 6, 9	A, E
Understanding and defining the stability of ICs.	10, 12, 14, 16, 19, 20, 21, 23, 6, 9	A, E, F
Understanding frequency compensation for ICs.	10, 12, 14, 16, 19, 21, 5, 6, 9	A, E, F
Understand'ng the design and compensation of OPAMPs.	10, 12, 14, 16, 19, 20, 21, 23, 4, 5, 6, 9	A, E

Teaching Methods	10: Discussion Method, 12: Problem Solving Method, 13: Case Study Method, 14: Self Study Method, 16: Question - Answer Technique, 17: Experimental Technique, 19: Brainstorming Technique, 2: Project Based Learning Model, 20: Reverse Brainstorming Technique, 21: Simulation Technique, 23: Concept Map Technique, 4: Inquiry-Based Learning, 5: Cooperative Learning, 6: Experiential Learning, 9: Lecture Method
Assessment Methods	A: Traditional Written Exam, E: Homework, F: Project Task

Lecture Schedule

Sequence	Topics	Preliminary Preparation
1	IntroductionReview of Diode and Transistor physics.Review of basic amplifiers	Read the book chapter.
2	Review of biasingReview of DC characteristics of OPAMPs.	Read the book chapter.
3	Introduction to Frequency ResponseIntroduction to Cadence	Read the book chapter
4	Frequency Response of Integrated Circuits	Read the book chapter
5	Bode plotsTime-constant methods	Read the book chapter
6	Pole-zero calculation	Read the book chapter.
7	Feedback techniques for Integrated Circuits	Read the book chapter
8	Review and assessments.	Read the book chapter.
9	Stability & Frequency Compensation	Read the book chapter.
10	Stability & Frequency Compensation	Read the book.
11	Practical Feedback & Loading	Read the book.
12	Opamp design.	Read the book.
13	Opamp design.	Read the book chapter.
14	PROJECT PRESENTATIONS and FINAL REVIEW	Read the book chapter.

Evaluation Methods	Weight(%)
Midterm Exam	30
General Exam	70

Resources
Sedra/Smith: Microelectronic Circuits, 7EGray, Hurst, Lewis, and Meyer: "Analysis and design of Analog Integrated Circuits", 4th Edition