

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

2022 - 2023 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	Lect. Mustafa AKTAN				
Name of Lecturer(s)	Lect. 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.			1, 10, 12, 14, 15, 2, 3, 4, 9	A, C, D	
Understanding the frequency response of the ICs.			1, 10, 14, 15, 16, 17, 2, 3, 4, 8, 9	A, C, D	
Pole-zero calculation and understanding time constant methods.			1, 10, 12, 14, 15, 17, 18, 19, 2, 3, 4, 8	A, C, D	
Understading feedback techniques for ICs.			1, 10, 12, 13, 14, 15, 19, 3, 4	A, C	
Understanding and defining the stability of ICs.			1, 10, 14, 15, 17, 19, 2, 3, 4, 9	A, C, D	
Understanding frequency compensation for ICs.			1, 10, 14, 15, 2, 3, 4, 8, 9	A, C, D	
Understand'ng the design and compensation of OPAMPs.			1, 10, 14, 15, 17, 18, 19, 2, 3, 4, 8, 9	A, C	
Teaching Methods	1: Lecture, 10: Brainstorming, 12: Case study, 13: Experiment / Laboratory, 14: Self-Study, 15: Problem solving, 16: Project Based Learning, 17: Reflective Thinking, 18: Case Study, 19: Concept map, 2: Question - Answer, 3: Discussion, 4: Exercise, Practice, 8: Teamwork, 9: Simulation				
Assessment Methods	A: Written Exam, C: Homework, D: Project / Design				
Lecture Schedule					
Sequenc e	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