

Alanya Alaaddin Keykubat University | Rafet Kayış Faculty of Engineering
Electrical-Electronics Engineering Department
 2023-2024 Fall Semester

Syllabus

Code/Name	EEE 305 / Analog Electronics I
Type	Required
Credit/ECTS	5/5
Hour per Week	4
Level/Year	Undergraduate/3
Semester	Fall
Classroom	A103
Content	Basic semiconductor concept. Physical electronics. Physics of P-N diodes. Bipolar junction transistors (BJTs). Field effect transistors (FETs). Transistor biasing and small signal models. Unijunction transistors (UJTs). P-N-P-N switching devices. Negative resistance microwave devices. Lasers
Prerequisites	None
Textbooks	<i>Primary</i> A. S. Sedra & A. Grabel, Microelectronic Circuits & Devices, Oxford University Press, 7th Edition, 2014. <i>Supplementary</i> B. G. Streetman and S. Banerjee, Solid State Electronic Devices, Prentice Hall Series.
Objectives	<ul style="list-style-type: none"> • To learn the existing electronic circuit elements and their application fields • To have enough information to learn about new electronic circuit elements
Course Outcomes	In this course you will be able to: CO1 Understand semiconductor, electron and hole concepts CO2 Analyze rectifier, clipper and clamper diode circuits CO3 Understand physical operation of BJT and can analyze and design single stage BJT amplifiers CO4 Understand physical operation of FETs and can analyze and design single stage FET amplifiers CO5 Understand operation principles of special purpose diodes (varactor, tunnel diode, photodiode, LED, laser).

Weekly Schedule of Topics

W	Topic
1	Energy bands and charge carriers in semiconductors
2	Excess carriers in semiconductors
3	P-N junction under equilibrium conditions. P-N junction under forward and reverse bias conditions.
4	Transient and A-C conditions
5	Applications of p-n diodes
6	Other p-n diodes. Metal semiconductor junctions
7	Field-effect transistors. Junction field effect transistor.
8	MOS field effect transistor.
9	Bipolar junction transistor (BJT). Minority carrier distributions and terminal currents in BJT
10	Switching of BJT

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11	Optoelectronic devices: Photodiodes, LEDs and Lasers
12	Power devices: P-n-p-n diode, SCR and IGBT
13	Negative conductance of microwave devices: Tunnel diode, IMPATT diode and Gunn diode.
14	Introduction to integrated circuits

Contribution to Program Outcomes*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	5	5	1	5	0	5	1	3	1	3	0
CO2	5	5	1	4	0	5	4	3	4	3	0
CO3	5	5	3	5	2	5	1	3	1	3	0
CO4	5	4	3	5	0	5	2	3	1	4	0
CO5	5	4	1	4	0	5	4	3	4	1	2

* Contribution Level | 0: None | 1: Very Low | 2: Low | 3: Medium | 4: High | 5: Very High

Requirements	Basic knowledge of Electromagnetic Field Theory	
Course Policy	<ul style="list-style-type: none">• Be in the class on time.• English should always be used to communicate with one another.• At least 70% attendance is required, otherwise a grade of DZ will be assigned.	
Cheating & Plagiarism	<ul style="list-style-type: none">• Copying or letting someone copy your work on exams, assignments, or reports is cheating.• Cutting and pasting text, figures and tables from web sources or any other electronic source is plagiarism.• The consequence of academic dishonesty is to receive a grade of FF for the course.	
Evaluation	Midterm	40%
	<u>Final Exam</u>	<u>60%</u>
	Total	100%

Instructor

Name/Surname	Fikri Serdar Gökhan	Email	akin.oktav@alanya.edu.tr
Room	209	Office Hours	W 11.30-12.30 F 13.30-14.30

Prepared by Akin Uslu on June 10th, 2024.