

Faculty of Engineering & Technology

Electronic Circuits

Information :

Course Code : ELE 364

Level : Undergraduate

Course Hours : 4.00- Hours

Department : Department of Electrical Engineering

Instructor Information :

Title	Name	Office hours
Lecturer	Ahmed Hosni Ali Mohamed Elghandour	8
Assistant Lecturer	Lamia Hamdy Ahmed Kamal Shehab Eldin	

Area Of Study :

- Understand the principles of circuit design and its applications.
- Analyze the performance and implement electronic circuits.
- Train student to perform experiments on electronic circuits using software tools for circuit design and simulation.

Description :

Transistor small signal model, model, Analysis of audio frequency (AF) amplifiers: RC-coupled, high frequency model and frequency response, AF power amplifiers: Class-A, Push-pull operation (Class-A, Class-B, Class AB), Feedback amplifiers (FB): FB concept, stability, general characteristics of negative FB amplifiers, input and output impedances with FB, difference amplifier Operational amplifiers (OPAMPs):, OPAMP specifications and frequency characteristics, OPAMP applications: inverting, non-inverting, adder, subtracter, integrator, differentiator, Oscillators: concept of stability and oscillations, OPAMP oscillators (rectangular, sinusoidal, Wien bridge, phase shift, and tuned circuits). Multivibrators (MVs): bistable MVs, triggering, schmitt trigger, monostable and astable MVs, wave shaping circuits and the 555 timer

Course outcomes :

a. Knowledge and Understanding: :

1 -	a1. Describe the AF amplifiers and their frequency response.
2 -	a2. List the various power amplifier circuits.
3 -	a3. Recognize the design of the OPAMP amplifier circuits and their applications.
4 -	a4. Recognize the multi-stage amplifiers including differential amplifier circuits.
5 -	a5. Define the feedback circuits and their amplifiers.
6 -	a6. Determine the various applications of oscillators.

b. Intellectual Skills: :

1 -	b1. Analyze problems of amplifier circuits (OPAMP amplifiers, power amplifiers, multi-stage amplifiers, and feedback amplifiers) and search for optimized solutions.
2 -	b2. Use professional software tools for design and implementing of electronic circuits.
3 -	b3. Prepare a technical design report on an assignment.

4 -	b4. Design of electronic circuits for engineering applications.
5 -	b5. Assess and evaluate the characteristics and performance of electronic circuits.
c. Professional and Practical Skills: :	
1 -	c1. Apply theories and techniques of mathematics, basic electricity and electronics to solve electronic circuit problem.
2 -	c2. Identify the components and requirements for designing a complete application circuit.
3 -	c3. Use computational facilities and related software tools, measuring instruments, workshops and/or relevant laboratory equipment to design and diagnosis experiments.
4 -	c4. Read thoroughly datasheets and identify appropriate specifications for required device and circuits.
d. General and Transferable Skills: :	
1 -	d1. Collaborate effectively within multidisciplinary team
2 -	d2. Communicate effectively.
3 -	d3. Effectively manage tasks, time, and resources.
4 -	d4. Search for information and engage in life-long self-learning discipline.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Frequency response of the single stage amplifier RC-coupled audio frequency (AF) amplifiers.	9	6	3
Power Amplifiers	12	6	6
OP-AMP amplifier and the first Mid-term	21	12	6
Differential Amplifiers	12	6	6
Multistage Amplifiers	12	6	6
Feedback Amplifier and the second Mid-term	15	9	6
Oscillator and Multi-vibrator	9	6	3

Teaching And Learning Methodologies :

Interactive Lecturing
Problem solving
Discussion
Experiential Learning

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Final Exam	40.00		
o In Class Quizzes and participation	20.00		
o Lab Experiments & Project	10.00		
o Mid-Term Exams	30.00		

Course Notes :

No course notes are required

Recommended books :

"Electronic Principles", 7th edition, A. Malvino.
~~www~~ Electronic Circuit Analysis and Design-2nd ed., Neamen D.