

Siruseri IT park, OMR, Chennai - 603103

LESSON PLAN							
Department of <u>Electronics and Communication</u> Engineering							
Name of the Subject	ELECTRONIC CIRCUITS II	Name of the handling Faculty	Mrs.S.Priyadharshini				
Subject Code	EC8452	Year / Sem	II/IV				
Academic Year	2021-2022	Batch	2020-2024				
Course Objective							
To give a comprehensive exposure to all types of amplifiers and oscillators constructed with discrete components. This helps to develop a strong basis for building linear and digital integrated circuits							
To study about feedback amplifiers and oscillators principles							
To design oscillators.							
To study about turned amplifier.							
To understand the analysis and design of LC and RC oscillators, amplifiers, multi vibrators, power amplifiers and DC convertors							
Course Outcome							
Design and analyze feedback amplifiers							
Design LC and RC oscillators and analyze the frequency of oscillation							
Analyse the performance of tuned amplifiers							
Design wave shaping circuits and multivibrators.							
Analyze performance of power amplifier and DC convertors.							
Lesson Plan							
Sl. No.	Topic(s)	T / R*	Periods Required	Mode of Teaching (BB / PPT / NPTEL / MOOC / etc)	Blooms Level (L1-L6)	CO	
		Book					
UNIT I FEEDBACK AMPLIFIERS AND STABILITY							
1	Feedback Concepts	T1,T2	1	BB,NPTEL	L1	CO1	PO1
2	Gain with feedback	T1,T2	1	BB,PPT	L2	CO1	PO1-PO2
3	Effect of feedback on gain stability, distortion	T1,T2	1	BB,PPT	L2	CO1	PO1-PO3
4	input and output impedances	T1,T2	1	BB,PPT	L2	CO1	PO1-PO2
5	DC Transfer characteristics	T1,T2	1	BB	L2	CO1	PO1-PO3
6	Topologies of feedback amplifiers	T1,T2	1	BB	L2	CO1	PO1-PO2
7	Analysis of series-series, shunt-shunt	T1,R4	1	BB,PPT	L3	CO1	PO1-PO3
8	Shunt-series feedback amplifiers	T1,T2	1	BB,PPT	L3	CO1	PO1-PO4,PO5
9	Stability,Gain and Phase-margins,Frequency compensation	T1,T2	1	BB	L2	CO1	PO1-PO3
Suggested Activity : Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any In-class activity -Assignment:Problems on feedback amplifiers							
Evaluation method : Assignments							
UNIT II OSCILLATORS							
10	Barkhausen criterion for oscillation	T1,T2	1	BB,NPTEL	L1	CO2	PO1-PO3
11	Phase shift oscillator	T1,T2	2	BB,PPT	L4	CO2	PO1-PO4,PO5
12	Wien bridge oscillator	T1,T2	1	BB	L3	CO2	PO1-PO3,PO5
13	Hartley oscillator	T1,T2	1	BB	L3	CO2	PO1-PO3,PO5
14	Colpitt's oscillator	T1,T2	1	BB	L3	CO2	PO1-PO3,PO5
15	Ring oscillators	T1,T2	1	BB,PPT	L2	CO2	PO1-PO3
16	Crystal oscillators	T1,T2	1	BB,NPTEL	L2	CO2	PO1-PO3
17	Oscillator amplitude stabilization	T1,T2	1	BB,PPT	L2	CO2	PO1-PO3
Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any In-class activity - On class Tutorials: Design and implement problems on RC and Colpitt's Oscillator							
Evaluation method : Problems.							
UNIT III TUNED AMPLIFIERS							

18	Coil losses	T2,R2	1	BB	L2	CO3	PO1-PO3
19	Unloaded and loaded Q of tank circuits	T2,R2	1	BB	L2	CO3	PO1-PO3
20	Small signal tuned amplifier	T2,R2	1	BB	L3	CO3	PO1-PO4,PO5
21	Analysis of capacitor coupled single tuned amplifier	T2,R2	1	BB	L2	CO3	PO1-PO3,PO5
22	Double tuned amplifier	T2,R2	1	BB	L2	CO3	PO1-PO3
23	Effect of cascading single tuned and double tuned amplifiers on bandwidth	T2,R2	1	BB	L2	CO3	PO1-PO3
24	Stagger tuned amplifiers	T2,R2	1	BB	L2	CO3	PO1-PO3
25	Stability of tuned amplifiers	T2,R2	1	BB	L2	CO3	PO1-PO3
26	Neutralization -Hazeltine neutralization method.	T2,R2	1	BB,PPT	L3	CO3	PO1-PO3

Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any
Quiz

Evaluation method : Online MCQ

UNIT-IV WAVE SHAPING AND MULTIVIBRATOR CIRCUITS

27	Pulse circuits	T2,R2	1	BB	L2	CO4	PO1-PO3
28	Attenuators	T2,R2	1	BB	L3	CO4	PO1-PO3
29	RC integrator& differentiator circuits	T2,R2	1	BB	L3	CO4	PO1-PO3,PO5
30	diode clampers	T2,R2	1	BB	L2	CO4	PO1-PO3
31	Clippers	T2,R2	1	BB	L2	CO4	PO1-PO3,PO5
32	Multivibrators	T2,R2	1	BB,PPT	L4	CO4	PO1-PO4,PO5
33	Multivibrators	T2,R2	1	BB,PPT	L2	CO4	PO1-PO3
34	Schmitt Trigger	T2,R2	1	BB	L3	CO4	PO1-PO3
35	UJT Oscillator	T2,R2	1	BB	L3	CO4	PO1-PO3

Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any : discuss about types of multivibrators and their performances : Running light circuit design Using Astable Multivibrator

Evaluation method : Test the working circuit .

UNIT-V POWER AMPLIFIERS AND DC CONVERTERS

36	Power amplifiers- class A	T1,R1	1	BB,PPT	L3	CO5	PO1-PO3,PO12
37	Class A	T1,R1	1	BB,PPT	L2	CO5	PO1-PO3
38	Class B, Class AB	T1,R1	1	BB	L2	CO5	PO1-PO3
39	Class C,Power MOSFET	T1,R1	1	BB,PPT	L2	CO5	PO1-PO3
40	Temperature Effect	T1,R1	1	BB,PPT	L3	CO5	PO1-PO3
41	Class AB Power amplifier using MOSFET	T1,R1	1	BB,PPT	L2	CO5	PO1-PO3
42	DC/DC convertors	T1,R1	1	BB	L2	CO5	PO1-PO3
43	Buck, Boost design	T1,R1	1	BB,PPT	L3	CO5	PO1-PO3,PO5
44	Buck-Boost analysis and design	T1,R1	1	BB,PPT	L2	CO5	PO1-PO3

Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any problems solving in blocking oscillators :Assignment on Buck-boost convertors and Problems

Evaluation method: Assignment

Content Beyond the Syllabus Planned

1	Opto-electronic oscillator
2	FinFET Devices and Technology

Text Books

1	Sedra and Smith, —Micro Electronic Circuits!; Sixth Edition, Oxford University Press, 2011. (UNIT I, III,IV,V)
2	Jacob Millman, „Microelectronics‘, McGraw Hill, 2nd Edition, Reprinted, 2009. (UNIT I,II,IV,V)

Reference Books

1	Robert L. Boylestad and Louis Nasheresky, —Electronic Devices and Circuit Theoryl, 10th Edition, Pearson Education / PHI, 2008
2	David A. Bell, —Electronic Devices and Circuits!, Fifth Edition, Oxford University Press, 2008.
3	Millman J. and Taub H., —Pulse Digital and Switching Waveforms!, TMH, 2000.
4	Millman and Halkias. C., Integrated Electronics, TMH, 2007.

Website / URL References														
1	https://nptel.ac.in/content/storage2/courses/117101106/downloads/L17.PDF													
2	https://nptel.ac.in/content/storage2/courses/117101106/downloads/L23.PDF													
3	http://www.iitg.ac.in/apvajpevi/ph218/Lec-18.pdf													
Blooms Level														
Level 1 (L1) : Remembering					Lower Order Thinkin g	Fixed Hour Exams	Level 4 (L4) : Analysing						Higher Order Thinkin g	Projects / Mini Projects
Level 2 (L2) : Understanding							Level 5 (L5) : Evaluating							
Level 3 (L3) : Applying							Level 6 (L6) : Creating							
Mapping syllabus with Bloom's Taxonomy LOT and HOT														
Unit No	Unit Name					L1	L2	L3	L4	L5	L6	LOT	HOT	Total
Unit 1	FEEDBACK AMPLIFIERS AND STABILITY					1	6	2	0	0	0	9	0	9
Unit 2	OSCILLATORS					1	3	3	2	0	0	7	2	9
Unit 3	TUNED AMPLIFIERS					0	7	2	0	0	0	9	0	9
Unit 4	WAVE SHAPING AND MULTIVIBRATOR CIRCUITS					0	4	4	1	0	0	8	1	9
Unit 5	BLOCKING OSCILLATORS AND TIMEBASE GENERATORS					0	6	3	0	0	0	9	0	9
Total					2	26	14	1	0	0	42	3	45	
Total Percentage					4.44	57.78	31.11	2.22	0.00	0.00	93.33	6.67	100.00	
CO PO Mapping														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1	1	0	0	0	0	0	0	0	1	1	0
CO2	3	2	1	1	2	0	0	0	0	0	0	0	2	0
CO3	3	3	2	1	1	0	0	0	0	0	0	0	2	0
CO4	3	3	2	1	1	1	0	0	0	0	1	1	2	0
CO5	3	2	1	0	1	1	0	0	0	0		0	1	0
Avg	3	2.4	1.4	0.8	1	0.4	0	0	0	0	0.2	0.4	1.6	0
Justification for CO-PO mapping														
CO1	High correlation for PO1 and medium corrlation (PO2),less correlation (CO1) is given as the CO1 can be used to apply knowledge of engineering to Identify , formulate and provide solutions amd less correlation for PO4 provide solutions by using relevant techniques add tools. Less correlation for PSO1 is given as components are required for the design of analyze, design and develop solutions..													
CO2	High correlation for PO1 and medium corrlation (PO2),less correlation (CO1) is given as the CO1 can be used to apply knowledge of engineering to Identify , formulate and provide solutions amd less correlation for PO4 ,PO5provide solutions by using relevant techniques add tools. Less correlation for PSO1 is given as components are required for the design of analyze, design and develop solutions.													
CO3	High correlation for PO1-PO2 and medium PO3 is given as the CO3 can be used to apply knowledge of engineering to Identify , formulate and provide solutions and Less correlation for PO4,PO5 provide solutions by using relevant techniques and tools.Medium correlation for PSO1 is given as design of analyze, design and develop solutions..													
CO4	High correlation for PO1-PO2,Medium correlation for CO4, can be used to apply knowledge of engineering to Identify , formulate and provide solutions and less correlation for PO4,PO5 for CO4 provide solutions by using relevant techniques and tools. Correlation for PO12 is given as the knowledge on technique and testing techniques require life long learning.Medium correlation for PSO1 is given as design of analyze, design and develop solutions..													
CO5	High correlation for PO1,Medium correlation for PO2,PO3 for CO5 can be used to apply knowledge of engineering to Identify , formulateand provide solutions and less correlation for PO5 provide solutions by using relevant techniques and tools Correlation for PO12 is given as the knowledge on technique and testing techniques require life long learning.Medium correlation for PSO1 is given as design of analyze, design and develop solutions..													
3	High level				2		Moderate level				1		Low level	
Name & Sign of Faculty Incharge :Mrs.S.Priyadharshini														
Name & Sign of Subject Expert :														
Head of the Department : Mrs.M.Kamarajan														

