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DHANALAKSHMI SRINIVASAN
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COURSE PLAN

Subject code: EC8452	**Branch/Year/Sem/Section: B.E ECE/II/IV**
Subject Name: ELECRTRONIC CIRCUITS-II	**Batch:2018-2022**
Staff Name:S.MIRDULA	**Academic year:2019-2020**

COURSE OBJECTIVE

1. 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.
2. To study about feedback amplifiers and oscillators principles.
3. To design oscillators.
4. To study about Tuned amplifier
5. To understand the analysis and design of LC and RC oscillators, amplifiers, multi vibrators, power amplifiers and DC convertors.

TEXT BOOK:

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)

REFERENCES:

1. Robert L. Boylestad and Louis Nasheresky, ―Electronic Devices and Circuit Theory‖, 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.

WEB RESOURCES

W1: http://www.electronics-tutorials.ws/transistor/tran_1.html
W2 :http://people.virgina.edu/-ag7rq/663/Fall10/MOS BJT_Comparison.pdf
W3:http://www.nsti.org/Nanotech2004/WCM2004/WCM2004-YCheng.pdf

TEACHING METHODOLOGIES:

- BB - BLACK BOARD
- PPT - POWER POINT PRESENTATION

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

EC8452	ELECTRONIC CIRCUITS II	L	T	P	C
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UNIT I FEEDBACK AMPLIFIERS AND STABILITY 9

Feedback Concepts – gain with feedback – effect of feedback on gain stability, distortion, bandwidth, input and output impedances; topologies of feedback amplifiers – analysis of series-series, shunt-shunt and shunt-series feedback amplifiers-stability problem-Gain and Phase-margins-Frequency compensation.

UNIT II OSCILLATORS 9

Barkhausen criterion for oscillation – phase shift, Wien bridge - Hartley & Colpitt‘s oscillators – Clapp oscillator-Ring oscillators and crystal oscillators – oscillator amplitude stabilization.

UNIT III TUNED AMPLIFIERS 9

Coil losses, unloaded and loaded Q of tank circuits, small signal tuned amplifiers – Analysis of capacitor coupled single tuned amplifier – double tuned amplifier - effect of cascading single tuned and double tuned amplifiers on bandwidth – Stagger tuned amplifiers - Stability of tuned amplifiers – Neutralization - Hazeltine neutralization method.

UNIT IV WAVE SHAPING AND MULTIVIBRATOR CIRCUITS 9

Pulse circuits – attenuators – RC integrator and differentiator circuits – diode clampers and clippers –Multivibrators - Schmitt Trigger-UJT Oscillator.

UNIT V POWER AMPLIFIERS AND DC CONVERTERS 9

Power amplifiers- class A-Class B-Class AB-Class C-Power MOSFET-Temperature Effect- Class AB Power amplifier using MOSFET –DC/DC convertors – Buck, Boost, Buck-Boost analysis and design

TOTAL: 45 PERIODS

Topic No	Topic Name	Books For reference	Page No	Teaching Methodology	No of periods required	Cumulative periods
UNIT I	**FEEDBACK AMPLIFIERS AND STABILITY**					**(9)**
1.	Feedback Concepts – gain with feedback	R4	1.3	BB	1	1
2.	Effetct of feedback on gain stability, distortion, bandwidth.	R4	1.8	BB	1	2
3.	input and output impedances	R4	1.8	BB	1	3
4.	analysis of series-series	R4	1.16-1.25	BB	1	4
5.	shunt-shunt	R4	1.18-1.32	BB	1	5
6.	shunt-series feedback amplifiers	R4	1.19-1.37	BB	1	6
7.	stability problem	R4	1.45	PPT	1	7
8.	Gain and Phase-margins	R4	1.45	PPT	1	8
9.	Frequency compensation	-	NOTES	PPT	1	9
LEARNING OUTCOME: **At the end of unit , the students will be able to** • Design and analyze feedback amplifiers.						
UNIT II	**OSCILLATORS**					**(9)**
10.	Barkhausen criterion for oscillation	R4	2.2	BB	1	10
11.	phase shift,	R4	2.16	BB	1	11
12.	Wien bridge	R4	2.28	BB	1	12
13.	Hartley	R4	2.5	BB	1	13
14.	Colpitt‘s oscillators	R4	2.5	BB	1	14
15.	Clapp oscillator	R4	2.13	BB	1	15
16.	Ring oscillators	R4	NOTES	BB	1	16

17.	crystal oscillators	R4	2.32	BB	1	17
18.	oscillator amplitude stabilization	R4	2.36	BB	1	18
LEARNING OUTCOME: **At the end of unit , the students will be able to** • Design LC and RC oscillators,						
UNIT – III		**TUNED AMPLIFIERS**				**(9)**
19.	Coil losses, unloaded and loaded Q of tank circuits	R4	3.2	BB	1	19
20.	small signal tuned amplifiers, double tuned amplifier	R4	3.12	BB	1	20
21.	Analysis of capacitor coupled single tuned amplifier	R4	3.6	BB	1	21
22.	effect of cascading single tuned amplifiers on bandwidth	R4	3.21	BB	1	22
23.	effect of cascading double tuned amplifiers on bandwidth	R4	3.21	BB	1	23
24.	Stagger tuned amplifiers	R4	3.23	BB	1	24
25.	Stability of tuned amplifiers	R4	3.28	BB	1	25
26.	Neutralization	R4	3.30	BB	1	26
27.	Hazeltine neutralization method.	R4	3.30	PPT	1	27
LEARNING OUTCOME: **At the end of unit , the students will be able to** • Analyze Tuned Amplifiers						
UNIT IV		**WAVE SHAPING AND MULTIVIBRATOR CIRCUITS**				**(9)**
28.	Pulse circuits	-	NOTES	BB	1	28
29.	attenuators	R4	4.12	BB	1	29
30.	RC integrator	R4	4.1	BB	1	30
31.	RC Differentiator circuits	R4	4.1	BB	1	31
32.	Diode clampers and clippers	R4	4.31	BB	1	32
33.	Multivibrators	R4	4.46	BB	1	33

34.	Astable Multivibrator & Monostable Multivibrator	R4	4.46	BB	1	34
35.	Schmitt Trigger	R4	4.65	PPT	1	35
36.	UJT Oscillator	R4	5.1	BB	1	36

LEARNING OUTCOME:

At the end of unit , the students will be able to

- Design wave shaping circuits, multivibrators,

UNIT V	**POWER AMPLIFIERS AND DC CONVERTERS**					**(9)**
37.	Power amplifiers	T1	781-786	BB	1	37
38.	class A-Class B	T1	789-791	BB	1	38
39.	Class C	T1	792-799	BB	1	39
40.	MOSFET-Temperature Effect	T1	800-808	BB	1	40
41.	Class AB Power amplifier using MOSFET	T1	815-817	BB	1	41
42.	DC/DC convertors	T1	809-818	BB	1	42
43.	Buck	T1	657	PPT	1	43
44.	**Boost**	T1	661	PPT	1	44
45.	Buck-Boost analysis and design	T1	672	PPT	1	45

LEARNING OUTCOME:

At the end of unit , the students will be able to

Design power amplifier and DC convertors.

COURSE OUTCOME

At the end of the course, the student should be able to:

Analyze different types of amplifier, oscillator and multivibrator circuits
Design BJT amplifier and oscillator circuits
Analyze transistorized amplifier and oscillator circuits
Design and analyze feedback amplifiers
Design LC and RC oscillators, tuned amplifiers, wave shaping circuits, multivibrators, power amplifier and DC convertors.

CONTENT BEYOND THE SYLLABUS

Modified Neutralization
Class D Amplifiers

CONTINUES INTERNAL ASSESSMENT DETAILS

ASSESMENT NUMBER	I	II	MODEL
TOPIC NO.(UNIT)	1-18 (1st & 2nd units)	19-36 (3rd & 4th units)	1-45 (units 1-5)

ASSIGNMENT DETAILS

ASSIGNMENT NUMBER	I	II	III
TOPIC NUMBER FOR REFERENCE	1-18 (1st & 2nd units)	19-36 (3rd & 4th units)	1-45 (units 1-5)
DEAD LINE			

ASSIGNMENT NUMBER	BATCH	DESCRIPTIVE QUESTIONS/TOPIC (Minimum of 8 Pages)
I	B1	1. Gain and Phase-margins 2. Frequency compensation 3. stability problem
II	B1	1. Neutralization 2. Hazeltine neutralization method 3. Ring oscillators
III	B1	1. MOSFET-Temperature Effect 2. Class AB Power amplifier using MOSFET 3. Buck-Boost analysis and design

PREPARED BY **VERIFIED BY**

S.MIRDULA, AP/ECE **HOD/ECE**

APPROVED BY

PRINCIPAL