
 <p>NAGARJUNA COLLEGE OF ENGINEERING AND TECHNOLOGY</p>	<p>NAGARJUNA COLLEGE OF ENGINEERING AND TECHNOLOGY NAAC Accredited with “A” grade (An ISO 9001 – 2008 Certified Institution) Affiliated to Visvesvaraya Technological University (VTU) Recognized by Govt. of Karnataka & Approved by A.I.C.T.E. New Delhi DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING</p>	 <p>DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING NCET</p>
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Course Handout

General Handout for all courses appended to the time table

<p>Course No. : 22ECT34</p>	<p>Dept.: Electronics and Communication Engineering</p>
<p>Course Title : Analog Electronic Circuits</p>	<p>Semester: IIIrd</p>
<p>Instructor-in-charge : Mrs. Bhargavi K V bhargavi.kv@ncetmail.com Mr. Yashodhara C L yashodhara.cl@ncetmail.com</p>	<p>Academic Year: 2023-24</p>

Subject Description:

Analog electronics is a branch of electronics that deals with a continuously variable signal. It's widely used in radio and audio equipment along with other applications where signals are derived from analog sensors before being converted into digital signals for subsequent storage and processing. Although digital circuits are considered as a dominant part of today's technological world, some of the most fundamental components in a digital system are actually analog in nature. Analog circuits can be defined as a complex combination of op amps, resistors, caps, and other basic electronic components. These circuits can be as simple as a combination of two resistors to make a voltage divider or elegantly built with many components. Such circuits can attenuate, amplify, isolate, modify, distort the signal, or even convert the original one into a digital signal.

Text Books

1. Albert Malvino, David J Bates, Electronic Principles, 7th Edition, Mc Graw Hill Education, 2017, ISBN:978-0-07 063424-4.
2. Microelectronic Circuits, Theory and Applications, Adel S Sedra, Kenneth C Smith, 5th Edition, Oxford, 2015.ISBN:978-0-19-808913-1.
3. Op-amps and Linear Integrated Circuits, Ramakant A Gayakwad, 4th Edition, Pearson Education, 2018. ISBN: 978-93-325-4991-3.

REFERENCE BOOKS:

1. Integrated Electronics: Analog and Digital Circuits and Systems, Jacob Millman, Christos C. Halkias, McGraw-Hill, 2015.
2. Electronic Devices and Circuit, Boylestad & Nashelsky, Eleventh Edition, Pearson, January 2015.
3. Analog Electronic Circuits, U B Mahadevaswamy, PEARSON, ISBN 978-81-317-3234-2, Sixth Edition.

PREREQUISITES:

1.Basic Electronics	Self-study	Remarks Students have completed this Courses
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LECTURE PLAN:

Topic	Topic Details	Number of Lectures	Unit/ Chapter Reference
Module- I BJT models	BJT models: Introduction	1	T1 7.1
	Biasing in BJT	2	T1 7.5
	Emitter Biased Amplifier	3	T1 7.9
	Two transistor model	4	T1 8.2
	Small signal operation and Models Collector current and transconductance	5	T1 8.3
	Base current and input resistance Emitter current and input resistance	6	T1 8.6
	Voltage gain. Darlington Connections	7	T1 9.6
	Voltage regulation.	8	T1 9.7
Module – II Linear Op-amp Circuits	Linear Op-amp Circuits: 2-input Summing Amplifier	9	T1 18.6
	D/A Converter	10	T1 20.1
	Nonlinear Op-amp Circuits: Comparator with zero references.	11	T1 21.1
	Comparator without zero references.	12	T1 21.3
	Oscillator (Using BJT only): Generation of Sinusoidal Oscillation using tank circuit	13	T1 21.4
	RC Phase Shift Oscillator	14	T1 21.5
	Crystal Oscillator	15	T1 21.6
	The 555 timer: Monostable Operation, Astable Operation.	16	T1 21.7
Revision			
AAT-1			

Module – III Negative Feedback Op-amp	Negative Feedback Op-amp: General feedback structure	17	T3 3.1
	Properties of negative feedback, The Four Basic Feedback Topologies	18	T3 3.2
	series-shunt, series-series	19	T3 3.2
	shunt-shunt and shunt-series amplifiers (Qualitative Analysis without practical circuits)	20	T3 3.3
	Active Filters: High and low Pass Filters	21	T3 7.2
	Band-pass Filters	22	T3 7.3
	Band-stop Filters	23	T3 7.5
	First order low pass butter-worth filter.	24	T3 7.8 7.9
Module– IV Thyristors and Power Amplifiers	Thyristors: The four layer Diode	25	T113.1
	SCR	26	T113.1
	IGBTs	27	T113.2
	Other Thyristors	28	T113.4 13.6
	Power Amplifiers: Amplifier terms, classifications	29	T110.1
	Class A Operation	30	T110.3
	Class B operation, Class B push pull emitter follower	31	T110.4
	Class C Operation	32	T110.8
Revision			
AAT-2			
Module – VMOSFET Amplifier configuration	MOSFET Amplifier configuration: Biasing in MOS amplifier circuits:	33	T1 8.1
	Fixing VGS	34	T18.2
	Fixing VG	35	T18.2.1
	Drain to Gate feedback resistor.	36	T18.2.2
	Basic configurations, characterizing amplifiers	37	T18.3
	CS amplifier with source resistance	38	T18.4
	CS amplifier without source resistance	39	T18.5
	The Common Gate Amplifier, Source follower. (Text 2: 4.5.1,4.5.2, 4.5.3, 4.7.1-4.7.6)	40	T18.5.1

Course Outcomes

At the end of the course the student will be able to:

CO1	Analyze the characteristics of BJTs for switching and amplifier circuits.
CO2	Design and interpret the applications of BJT with different circuit configurations and biasing conditions.
CO3	Distinguish the different feedback structures and filters.
CO4	Illustrate the different power electronics components and its functions.
CO5	Design and analyze the biasing circuits of MOSFETs.

CO-PO MAPPING:

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
	C204.1	3	3	2	2	1	-	-	-	2	1	1	1	3	1
C204.2	3	3	2	2	1	-	-	-	2	1	1	1	3	1	1
C204.3	3	3	2	2	1	-	-	-	2	1	1	1	3	2	1
C204.4	3	3	1	1	1	-	-	-	2	1	1	1	3	2	1
C204.5	3	2	1	1	1	-	-	-	2	1	1	1	2	2	1

Evaluation Scheme:

IPCC / Non- Integrated Courses :						
Evaluation Type		Component	Max Marks	Marks reduced to	Min. Marks	Evaluation Details
Theory Component	Internal Assessment Tests(IAT)	IAT-1	25	25	20	Average of two IATs, Scaled down to 25 marks
		IAT-2	25			
	Comprehensive Continuous Evaluations (CCE)	CCE-1	25	25		Minimum of two Assessment methods as per 22OB4.2 of regulations , Average of two CCEs, scaled down to 25 marks
		CCE-2	25			
Total CIE - Theory				50	20	Scale down marks of IAT and CCE to 20
SEE			100	50	18	Conducted for 100 marks and scaled down to 50.
CIE + SEE				100	40	

*CV, ME, ECE & ISE departments were accredited by NBA for 3 years

Notices: All notices will be displayed on NCET and in Department website.

Chamber Consultation Hour: Wednesday 2:30Pm to 4:00 Pm

Makeup Policy: To be granted only in case of serious illness or emergency.

Email Policy: Communication through email. If you want to discuss anything, you are most welcome to meet me during chamber consultation hours or immediately after the class.

Academic queries/doubts can be posted in Moodle.

Mrs. Bhargavi K V
Course-in-charge

Dr.Nagesh K N
HOD