



SWARNANDHRA

COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by NAAC with "A" Grade – 3.32 CGPA, Recognized under 2(f) & 12(B) of UGC Act 1956, Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada Seetharampuram, W.G.DT., Narsapur-534280, (Andhra Pradesh)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

TEACHING PLAN

Course Code	Course Title	Semester	Branches	Contact Periods/ Week	Academic Year	Date of commencement of Semester
23EC5T01	Analog & Digital IC Applications	V	ECE	5	2026-2027	22-06-2026

COURSE OUTCOMES

After completion of the course students can able to

1	Apply the operational principles and characteristics of op-amps to design and analyze analog circuits and active filters. (K3: Apply)
2	Deduce waveform generators and comparator circuits using op-amps and Timer (K4: Deduce)
3	Implement Digital-to-Analog and Analog-to-Digital conversion circuits in real-time applications and Compare different data conversion techniques (DAC and ADC) (K4: Compare)
4	Construct and troubleshoot combinational and sequential logic circuits using digital ICs. (K3: Construct)

(K3: Construct)						
UNIT	Out Comes / Bloom's Level	Topics No.	Topics/Activity	Text Book / Reference	Contact Hour	Delivery Method
I	CO 1: Apply the operational principles and characteristics of op-amps to design and analyze analog circuits and active filters.(K3: Apply)	UNIT-1: OPERATIONAL AMPLIFIER				
		1.1	Ideal and Practical Op-Amp	T1,R1	1	Chalk & Talk,
		1.2	Op-Amp Characteristics	T1,R1	1	
		1.3	DC and AC Characteristics	T1,R1	1	
		1.4	Features of 741 Op-Amp	T1,R1	1	
		1.5	Modes of Operation- AC Inverting Amplifiers,	T1,R1	1	
		1.6	AC Non-Inverting Amplifiers	T1,R1	1	
		1.7	Differential Amplifier	T1,R1	1	
		1.8	Instrumentation Amplifier	T1,R1	1	
		1.9	Differentiator	T1,R1	1	
		1.10	Integrators	T1,R1	1	
		1.11	Comparators	T1,R1	1	
		1.12	Schmitt Trigger	T1,R1	1	
		1.13	Voltage Regulators, Features of 723 Regulator	T1,R1	1	
		1.14	Three Terminal Voltage Regulators.	T1,R1	1	
		Class Test		1		
			Total	15		
II	CO2: Deduce waveform generators and comparator circuits using	UNIT – 2: OP-AMP, IC-555 & IC565 APPLICATIONS				
		2.1	Introduction to Active Filters	T1,R1	1	Chalk & Talk,
		2.2	Characteristics of Band pass, Band reject and All Pass Filters.	T1,R1	1	
		2.3	Characteristics of Band pass, Band	T1,R1	1	



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	op-amps and Timer (K4: Deduce)		reject and All Pass Filters.			PPT Active Learning & Case Study	
		2.4	Characteristics of Band pass, Band reject and All Pass Filters.	T1,R1	1		
		2.5	Analysis of 1st order LPF &	T1,R1	1		
		2.6	Analysis of 1st order HPF Butterworth Filters	T1,R1	1		
		2.7	Waveform Generators – Triangular,	T1,R1	1		
		2.8	Waveform Generators –Sawtooth, Square Wave	T1,R1	1		
		2.9	IC555 Timer-Functional Diagram	T1,R1	1		
		2.10	Monostable Operation, Applications	T1,R1	1		
		2.11	Astable Operation, Applications	T1,R1	1		
		2.12	IC565 PLL-Block Schematic	T1,R1	1		
		2.13	PLL Principle of operation and its Applications.	T1,R1	1		
			Class Test		1		
		Total					14
III	CO3: Implement Digital-to-Analog and Analog-to-Digital conversion circuits in real-time applications and Compare different data conversion techniques (DAC and ADC) (K4: Compare)	UNIT – 3: DATA CONVERTERS					Chalk & Talk, PPT Tutorial
		3.1	Introduction Data Converters and its techniques	T1,R1	1		
		3.2	Different types of DACs ,Weighted resistor DAC	T1,R1	1		
		3.3	R-2R ladder DAC	T1,R1	1		
		3.4	Inverted R-2R DAC	T1,R1	1		
		3.5	Different Types of ADCs, Parallel Comparator Type ADC	T1,R1	1		
		3.6	Counter Type ADC	T1,R1	1		
		3.7	Successive Approximation ADC	T1,R1	1		
		3.8	Dual Slope ADC	T1,R1	1		
		3.9	DAC and ADC Specifications	T1,R1	1		
			Class Test		1		
Total					10		
IV	CO4: Construct and troubleshoot combinational and sequential logic circuits using digital ICs.	UNIT – 4: COMBINATIONAL LOGIC ICs					Chalk & Talk, PPT Tutorial
		4.1	Specifications and Applications Digital ICs	T2 , R2	1		
		4.2	Decoders (74138,74139)	T2 , R2	1		
		4.3	Code Converters	T2 , R2	1		
		4.4	LED & 7 Segment Decoders with Drivers	T2 , R2	1		
		4.5	Encoders,	T2 , R2	1		



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	(K3: Construct)	4.6	Priority Encoders(74148)	T2 , R2	1		
		4.7	Multiplexers(74151)	T2 , R2	1		
		4.8	De-multiplexers(74155)	T2 , R2	1		
		4.9	Parallel Binary Adder/Subtractor (74283)	T2 , R2	1		
		4.10	Magnitude Comparators(7485)	T2 , R2	1		
			Class Test		1		
Total					11		
V	CO4 Construct and troubleshoot combinational and sequential logic circuits using digital ICs. (K3: Construct)	UNIT – 5 :SEQUENTIAL LOGIC IC's AND MEMORIES					Chalk & Talk, PPT Tutorial
		5.1	TTL Logic: NAND gate	T2 , R2	1		
		5.2	Totem Pole, Open Collector Outputs	T2 , R2	1		
		5.3	Fanin , Fanout,	T2 , R2	1		
		5.4	Electrical Behaviours	T2 , R2	1		
		5.5	Comparison of 74XX Series	T2 , R2	1		
		5.6	CMOS Logic: NAND,NOR Gates	T2 , R2	1		
		5.7	Fanin , Fanout,	T2 , R2	1		
		5.8	Electrical Behaviours	T2 , R2	1		
		5.9	Comparison of 4000,74XX,HC series	T2 , R2	1		
		5.10	Memories ROM Architecture	T2 , R2	1		
		5.11	Types of ROMs and applications	T2 , R2	1		
		5.12	RAM Architecture	T2 , R2	1		
		5.13	Static RAM	T2 , R2	1		
		5.14	Dynamic Ram	T2 , R2	1		
		Class Test					
Total					15		
Content beyond Syllabus (if needed)		Basic Differential Amplifier Configurations			1		
CUMULATIVE PROPOSED PERIODS					66		
Text Books:							
S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION						
1.	RamakanthA.Gayakwad-Op-Amps&LinearICs,PHI,2003.						
2.	FloydandJain-DigitalFundamentals,8thEd.,Pearson Education,2005						
Reference Books:							
S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION						
1.	D.Roy Chowdhury–Linear Integrated Circuits, New Age International(p) Ltd,2 nd Ed.,2003.						
2.	John.F. Wakerly–DigitalDesignPrinciplesandPractices,3 rd Ed.,Pearson,,2009.						
Web Details							
1.	www.youtube.com/watch?v=HicZcgdGxZY&list=PLwjK_iyK4LLCnW-df-53d-6yYrGb9zZc						
2.	www.youtube.com/playlist?list=PLwjK_iyK4LLDBB1E9MFbxGCEnmMMOAXOH						



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		Name	Signature with Date
i.	Faculty	1. Mr. L. V. S. Narayana 2. Mrs. E. Suma 3. Mr. M. Murali	1. L.V.S.N. 2. E. Suma 3. M. Murali
ii.	Course Coordinator	Mr. L. V. S. Narayana	L.V.S.N.
iii.	Module Coordinator	Dr. D. Nataraj	D. Nataraj
iv.	Programme Coordinator	Dr. B. S. Rao	B. S. Rao



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