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
23EC3T02	Electronic Devices And Circuits	III	A,B,C,D&E.	5	2025-26	14-07-2025

Course Outcomes.
After completion of the course students are able to

1	Explain the characteristics of different semiconductor diodes and its applications (K2)
2	Describe the concept of Non linear wave shaping circuits.(K2)
3	Apply biasing techniques to Transistors and FET. (K3)
4	Analyze the small signal analysis of BJT and FET.(K4)

UNIT	Out Comes / Bloom's Level	Topics No.	Topics/Activity	Text Book / Reference	Contact Hour	Delivery Method
1	CO1: Explain the characteristics of different semiconductor diodes & transistors and its applications (K2)	**1.Special Semiconductor Devices**				
		1.1	Varactor Diode Construction, operation and V-I Characteristics	T1	1	Chalk & Talk, Smart Board and PPT
		1.2	LED Construction, operation and V-I characteristics	T1	1	
		1.3	Photo diode Construction, operation and V-I characteristics	T1	1	
		1.4	Tunnel Diode Construction, operation and V-I characteristics	T1	1	
		1.5	UJT Construction, operation and V-I characteristics	T1	1	
		1.6	PNPN Diode Construction, operation and V-I characteristics	T1	1	

		1.7	SCR Construction, operation and V-I characteristics	T1	1	
		1.8	Basic Rectifier setup, HWR, FWR, Bridge rectifier	T1, T2	1	
		1.9	derivations of characteristics of rectifiers	T1, T2	1	
		1.10	Filters: L, C, LC, CLC.	T1,T2	1	
		1.11	Inductor filters rectifiers.	T1, T2	1	
		1.12	Capacitor filters rectifiers.	T1, T2	1	
		1.13	LC or L-Shape filter rectifiers.	T1, T2	1	
		1.14	CLC or π-section Filter.	T1, T2	1	
		1.15	Comparison of various filter circuits in terms of ripple factors	T1, T2	1	
		1.16	Class Test		1	
	Total				**16**	
2	CO2: To understand the concept of Non linear wave shaping circuits.(K2)	**2.Diode Circuits**				
		2.1	The Diode as a circuit element, The Load-Line concept, The Piecewise Linear Diode model,	T2	1	Chalk & Talk, Smart Board and PPT
		2.2	Clipping (limiting) circuits	T2	1	
		2.3	Clipping at One Independent Levels, Transfer Characteristics	T2	1	
		2.4	Clipping at Two Independent Levels, Transfer Characteristics	T2	1	
		2.5	Clippers problems	T2	1	
		2.6	Clippers problems	T2	1	
		2.7	Clamping circuits	T2	1	
		2.8	+ve Clamper Circuits	T2	1	
		2.9	-ve Clamper Circuits	T2	1	
		2.10	Clamper Problems	T2	1	
		2.11	Clamper Problems	T2	1	
		2.12	Comparators	T2	1	
		2.13	Transistor Clipper	T2	1	
		2.14	Class Test		1	
	Total				**14**	
3	CO3: Apply biasing techniques to Transistors and FET. (K3)	**3.Transistor Biasing and Thermal Stabilization**				
		3.1	Need for biasing operating point, load line analysis	T1	1	Chalk & Talk, Smart Board and PPT
		3.2	BJT biasing- methods, Basic stability	T1	1	
		3.3	fixed bias And Problems	T1	1	
		3.4	collector to base bias And Problems	T1	1	
		3.5	Self bias	T1	1	
		3.6	Stabilization against variations in V_{BE}, Ic, and β	T1	1	
		3.7	Stability factors, (S,S',S"), Bias compensation	T1	1	
		3.8	Thermal runaway, Thermal stability	T1	1	
		3.9	Transistor Amplifier: CE, CC amplifier	T1	1	

		3.10	Class Test		1	
	Total				**10**	
4	CO4: Analyze the small signal analysis of BJT and FET.(K4)	**4.Small Signal Low Frequency Transistor Amplifier Models**				
		4.1	**BJT:** Two port network, Transistor Hybrid Model, determination of h-parameters	T1, T2	1	Chalk & Talk, Smart Board and PPT
		4.2	conversion of h-parameters	T1, T2	1	
		4.3	generalized analysis of transistor amplifier model using h-parameters	T1, T2	1	
		4.4	Analysis of CB	T1, T2	1	
		4.5	CE and CC amplifiers using exact and approximate analysis	T1, T2	1	
		4.6	CE and CC amplifiers using exact and approximate analysis	T1, T2	1	
		4.7	Comparison of transistor amplifiers.	T1, T2	1	
		4.8	Problems H-Parameters	T1, T2	1	
		4.9	Problems H-Parameters	T1, T2	1	
		4.10	Class Test		1	
	Total				**10**	
5	CO4: Analyze the small signal analysis of BJT and FET.(K4)	**JFET and MOSFET:**				
		5.1	FET types, JFET operation, characteristics	T1	1	Chalk & Talk, Smart Board and PPT
		5.2	Small signal model of JFET	T1	1	
		5.3	Small signal model of JFET	T1	1	
		5.4	MOSFET Structure, Operation of MOSFET	T1	1	
		5.5	MOSFET Structure, Operation of MOSFET	T1	1	
		5.6	operation in triode region, operation in saturation region	T1	1	
		5.7	MOSFET as a variable resistor	T1	1	
		5.8	Derivation of V-I characteristics of MOSFET	T1	1	
		5.9	PMOS, NMOS and CMOS	T1	1	
		5.10	Class test		1	
Total					**10**	
CUMULATIVE PROPOSED PERIODS					**60**	

Text Books:	
Si.No	**AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION**
1	Millman's Electronic Devices and Circuits- J. Millman, C. C. Halkias and SatyabrataJit, Mc-GrawHill Education, 4th edition,2015.
2	Millman's Integrated Electronics-J. Millman, C. Halkias, and Ch. D. Parikh, Mc-GrawHillEducation,2nd Edition,2009.
3	Fundamentals of Microelectronics-Behzad Razavi, Wiley, 3rd edition, 2021.
Reference Books:	
Si.No	**Authors, Book Title, Edition, Publisher, Year of Publication**
1	Basic Electronics-Principles and Applications, Chinmoy Saha, ArindamHalder, Debarati Ganguly, Cambridge University Press.
2	Electronicsdevices&circuittheory-RobertL.BoylestadandLouiNashelsky, Pearson, 11th edition,2015.
3	Electronic Devices and Circuits-DavidA. Bell, Oxford UniversityPress,5th edition, 2008.
4	Electronic Devices and Circuits- S.Salivahanan, N.Suresh Kumar, Mc-GrawHill,5th edition, 2022.
Web Details	
1	https://www.electronicsforu.com/resources/electronic-devices-and-circuit-theory
2	https://www.elprocus.com/types-of-clipper-and-clamper-circuits-and-applications/

Si. No.	Faculty/ Coordinator.	Name	Signature with Date
I	Faculty-I	Dr.D.Nataraj	
ii	Faculty-II	Dr.B.V.Ramana	
iii	Course Coordinator	Dr.D.Nataraj	
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