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	ECE	5	2026-27	13-07-2026

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**				Chalk & Talk, Smart Board and PPT
		1.1	Varactor Diode Construction, operation and V-I Characteristics	T1	1	
		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	Derivation 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	
	Total				**15**	
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 (limiting) circuits with V_r	T2	1	
		2.4	Clipping at one Independent Level, Transfer Characteristics	T2	1	
		2.5	Clipping at Two Independent Levels, Transfer Characteristics	T2	1	
		2.6	Clippers problems	T2	1	
		2.7	Clippers problems(2-levels)	T2	1	
		2.8	Clamping circuits	T2	1	
		2.9	Clamping circuits with V_r	T2	1	
		2.10	+ve Clamper Circuits	T2	1	
		2.11	-ve Clamper Circuits	T2	1	
		2.12	Clamper Problems	T2	1	
		2.13	Clamper Problems(2-levels)	T2	1	
		2.14	Comparators	T2	1	
		2.15	Transistor Clipper	T2	1	
Total					**15**	
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	T1	1	
		3.3	Basic stability derivation.	T1	1	
		3.4	Derivation fixed bias and Problems.	T1	1	
		3.5	Collector to base bias and Problems.	T1	1	
		3.6	Derivation Self bias And Problems	T1	1	
		3.7	Stabilization against variations in V_{BE}, Ic, and β	T1	1	
		3.8	Stability factors, (S,S',S''), Bias compensation	T1	1	
		3.9	Thermal runaway, Thermal stability	T1	1	
		3.10	Transistor Amplifier: CE, CC Type	T1	1	
Total					**10**	
4		**4.Small Signal Low Frequency Transistor Amplifier Models**				
		4.1	**BJT:** Two port network, Transistor Hybrid Model	T1, T2	1	

	CO4: Analyze the small signal analysis of BJT and FET.(K4)	4.2	Determination of h-parameters	T1, T2	1	Chalk & Talk, Smart Board and PPT
		4.3	Conversion of h-parameters	T1, T2	1	
		4.4	Generalized analysis of transistor amplifier using h-parameters	T1, T2	1	
		4.5	Analysis of CB, CE AND CC	T1, T2	1	
		4.6	CE amplifiers approximate analysis.	T1, T2	1	
		4.7	CC amplifiers approximate analysis.	T1, T2	1	
		4.8	CE and CC amplifiers exact analysis	T1, T2	1	
		4.9	Comparison of transistor amplifiers.	T1, T2	1	
		4.10	Problems H-Parameters	T1, T2	1	
Total					**10**	
5	CO4: Analyze the small signal analysis of BJT and FET.(K4)	**JFET and MOSFET:**				
		5.1	FET operation, V-I characteristics.	T1	1	Chalk & Talk, Smart Board and PPT
		5.2	Small signal model of JFET(CS)	T1	1	
		5.3	Small signal model of JFET(CD)	T1	1	
		5.4	Small signal model of JFET(CG)	T1	1	
		5.5	MOSFET Structure and Operation.	T1	1	
		5.6	Operation of Triode region	T1	1	
		5.7	Operation of Saturation region	T1	1	
		5.8	MOSFET as a variable resistor	T1	1	
		5.9	V-I characteristics of MOSFET	T1	1	
		5.10	PMOS, NMOS and CMOS	T1	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-GrawHill Education, 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, Arindam Halder, Debarati Ganguly, Cambridge University Press.
2.	Electronicsdevices&circuittheory-RobertL.BoylestadandLouiNashelsky, Pearson, 11th edition,2015.
3.	Electronic Devices and Circuits-David A. Bell, Oxford University Press, 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/

Sl. No.	Course Expert	NAME	Signature with Date
I	Faculty-I	Dr.D.NATARAJ	
ii	Faculty-II	Dr.B.V.RAMANA	
iii	Faculty-II	Mrs.G. Santhi Kumari	
iv	Course Coordinator	Dr.D.NATARAJ	
v	Module Coordinator	Dr.D.NATARAJ	
vi	Programme Coordinator	Dr.B.S. RAO	

Principal

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