

COURSE CODE: 1151EE102		COURSE TITLE: ELECTRONIC DEVICES AND CIRCUITS				L	T	P	C			
						3	0	0	3			
COURSE CATEGORY: Program Core												
PREAMBLE : It is aimed to provide the basics of device operation and the characteristics for various devices along with the basic designing parameters for various circuits.												
PREREQUISITE COURSES: Basic Electrical Engineering												
RELATED COURSES: <ul style="list-style-type: none"> • Linear and Digital Integrated circuits • Power Electronics drives • Digital Electronics 												
COURSE EDUCATIONAL OBJECTIVES : The objectives of the course are to make the students, <ul style="list-style-type: none"> • An understanding of basic structure and operation of PN Junction devices • The Knowledge of types of rectifier, filters and regulators • An understanding the operation and characteristics of Bipolar Junction Transistor • The capability to analyze the characteristics of Field Effect Transistor and Multi-vibrators 												
COURSE OUTCOMES : Upon the successful completion of the course, students will be able to:												
CO Nos.	Course Outcomes					Knowledge Level (Based on revised Bloom's Taxonomy)						
C01	Analyze structure and operation of PN Junction devices					K2						
C02	Explain the different types of rectifier, filters and regulators					K2						
C03	Illustrate the operation and characteristics of Bipolar Junction Transistor					K3						
C04	Analyze the characteristics of Field Effect Transistor					K2						
C05	Understand the Condition for oscillations and Mutivibrators					K2						
CORRELATION OF COs AND POs												
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M	L	H					M	M		M	M
CO2	M	L	H					M	L		L	H
CO3	L	L	H					M	L		M	H
CO4	L	M	H					M	M		M	M
CO5	M	M	H					M	M		M	M
COURSE CONTENT:												
UNIT I	PN JUNCTION DEVICES									9		

PN junction diode – structure, operation and V-I characteristic-current equation of drift current density and diffusion current density-diffusion and transient capacitance – introduction to SCR, DIAC, TRIAC and UJT- display devices- LED, Laser diodes, Zener breakdown - zener reverse characteristic.		
UNIT II	RECTIFIERS, FILTERS AND REGULATORS	9
Half wave rectifier, ripple factor, full wave rectifier, Harmonic components in a rectifier circuit, clipper and clamper circuit and types, Inductor filter, Capacitor filter, LC- filter, Pi-section filter, and comparison of various filter circuits in terms of ripple factors, Simple circuit of a regulator using zener diode.		
UNIT III	BIPOLAR JUNCTION TRANSISTORS	9
BJT structure, operation and V-I characteristic- BJT small signal model – biasing – analysis of CE, CB, CC amplifiers- Gain and frequency response. BJT biasing, DC load line, fixed bias, Collector to base bias, self bias techniques for stabilization, comparison of Biasing Techniques		
UNIT IV	FET CHARACTERISTICS	9
MOSFET – structure, operation and V-I characteristic – types of MOSFET –MOSFET small signal model – biasing – analysis of CS and source follower – gain and frequency response- JFET –structure, operation and V-I characteristic. Introduction of IGBT, comparison of all transistors		
UNIT V	OSCILLATORS, MULTIVIBRATORS, POWER AND FEED BACK AMPLIFIERS	9
Condition for oscillations, phase shift – Wien Bridge, Hartley, Colpitts and Crystal Oscillators - UJT as relaxation oscillator. Multivibrators - Astable, Monostable and Bistable, CLASS A, B, AB, C and D power amplifiers. Feedback amplifiers and its types		
TOTAL: 45 PERIODS		
TEXTBOOKS:		
<ol style="list-style-type: none"> 1. V.K. Metha, “ Principles of Electronics” 2. David A. Bell, “Electronic devices and circuits”, Oxford University, 5Th Edition,2009. 3. Sedra smith, “Microelectronic circuits “Oxford University Press, 5th Edition 2011. 		
REFERENCE BOOKS:		
<ol style="list-style-type: none"> 1. Floyd, “Electron devices” Pearson Asia 5th Edition, 2011. 2. Donald A Neamen, “Electronic Circuit Analysis and Design” Tata McGraw Hill, 3rd edition 2012 		
ONLINE RESOURCES:		
www.nptel.co.in www.usstudy.in		