

15EE208	Electron Devices And Circuits		L	T	P	C
			3	0	0	3
Co-requisite:	NIL					
Prerequisite:	15EC101					
Data Book / Codes/Standards	NIL					
Course Category	P	PROFESSIONAL CORE	ELECTRONICS			
Course designed by	Department of Electrical and Electronics Engineering					
Approval	32 nd Academic Council Meeting, 2016					

PURPOSE	To familiarize the students with the design, analyze and application of electronic devices.					
INSTRUCTIONAL OBJECTIVES.			STUDENT OUTCOMES			
At the end of the course, the student will be able to						
1.	Familiarize with the electronic devices and its applications.	a				
2.	Understand the concepts of frequency response of amplifiers and different types of feedback	a	c	e		
3.	Gain knowledge about the design and analysis of multi-vibrators, oscillators and wave shaping circuits	a				

Session	Description of Topic	Contact hours	C-D-I-O	IOs	Reference
	UNIT I : SEMICONDUCTOR DEVICES AND ITS APPLICATIONS	8			
1.	Construction and Characteristics of DIAC, TRIAC, GTO, HEMT	2	C	1	1,7
2.	LED, LCD characteristics, Tunnel diode, Schottky diode.	2	C	1	3,4
3.	MOS as a charge transferring device-CCD,BBD	1	C	1	2
4.	Analysis and Performance of L, C, LC,CLC filters ,series and shunt regulators	2	C	1	3
5.	Switched mode power supply	1	C	1	3
	UNIT II : SMALL SIGNAL ANALYSIS	10			
6.	Operating point of a BJT - Biasing circuits for BJT- Bias stability- Thermal runaway - Use of a heat sink	2	C	2	3
7.	JFET – Biasing a JFET and MOSFET	2	C	2	3
8.	CE,CB,CC amplifier, Hybrid model- Evaluation of H- parameters - Cascade – Darlington connection	2	C	2	3
9.	Small signal equivalent circuits-Miller's theorem- boot-strapping	2	C	2	4
10.	Small signal model – CS and CD amplifiers- problems	2	C	2	3
	UNIT III : LARGE SIGNAL AMPLIFIERS	9			
11.	Classification of large signal amplifiers, Distortion in amplifiers	1	C	2	6
12.	Frequency response of different coupling schemes	2	C	2	3,7
13.	Determining efficiency of Class A amplifiers, Class B amplifier, push-pull amplifier	2	C	2	3
14.	Class C-Single , Double-stagger tuned amplifiers-neutralization methods, Class D amplifier – Class S amplifier -	2	C	2	3
15.	MOSFET power amplifier -Differential amplifiers: DC and AC analysis-CMRR.	2	C	2	3,5
	UNIT IV : FEED BACK AMPLIFIERS AND OSCILLATORS	10			
16.	Feedback amplifiers – Barkhausen criterion-Stability –Distortion	2	C	2	2,7
17.	Current - Voltage, series / shunt feedback amplifiers	3	C	2	3,7,8
18.	Design and analysis of RC phase-shift oscillator.	1	C,D	3	3,4

Session	Description of Topic	Contact hours	C-D-I-O	IOs	Reference
19.	Design and analysis - Wien-bridge oscillator, Hartely oscillator.	2	C,D	3	3,4
20.	Design and analysis of Colpitt's oscillator and Crystal oscillators.	1	C	3	3
21.	Working - Franklin, Armstrong and Twin T oscillators.	1	C	3	3,4
	UNIT V – WAVE SHAPING CIRCUITS	8			
22.	RC wave shaping circuits- Clampers and Clippers	1	C	3	3
23.	RC, RL-Integrator and Differentiator circuits- Storage, Delay and Calculation of Transistor Switching Times	1	C	3	5
24.	Speed-up Capacitor -Voltage Multiplier	1	C	3	5
25.	Multivibrators – Astable, Monostable	2	C	3	3
26.	Bistable - Analysis of performance parameters of multivibrators	1	C	3	3
27.	Schmitt trigger -UJT relaxation oscillators- Blocking Oscillators	1	C	3	3
28.	Time base circuits – Voltage-Time base circuit, Current-Time base circuit	1	C	3	3
	Total contact hours		45		

LEARNING RESOURCES

Sl. No.	TEXT BOOKS
1.	Jacob. Millman, Christos C.Halkias, “ <i>Electronic Devices and Circuits</i> ”, Tata McGraw Hill Publishing Limited, New Delhi, 2010.
2.	Floyd, “ <i>Electronic Devices</i> ”, Pearson Education Ltd”, New Delhi, 2012
REFERENCE BOOKS/OTHER READING MATERIAL	
3.	Sedha.R.S, “ <i>A Text Book of Applied Electronics</i> ”, Sultan Chand Publishers, 2008..
4.	Theodore F.Bogart,Jeffrey S.Beasley , Guillermo Rico,” <i>Electronic Devices and Circuits</i> ”, Pearson education ltd, New Delhi,2013
5.	Malvino, “ <i>Electronic Principles</i> ”, Tata McGraw Hill, 6th edition, 2006.
6.	Boylestad & Nashelsky, “ <i>Electronic Devices and Circuit Theory</i> ”, Prentice Hall of India (P) Ltd., Eighth edition, 2003.
7.	Gupta.J.B, “ <i>Electron Devices and Circuits</i> ”- S.K.Kataria & Sons, 2012
8.	David A Bell, “ <i>Electronic Devices and Circuits</i> ”, 5 th edition, 2008, Oxford University Press India

Course nature				Theory			
Assessment Method (Weightage 100%)							
In-semester	Assessment tool	Cycle test I	Cycle test II	Cycle Test III	Surprise Test	Quiz	Total
	Weightage	10%	15%	15%	5%	5%	50%
End semester examination Weightage :							50%