

GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme		Diploma Engineering			Branch		Electrical Engineering		
Semester		III			Version		1.0.0.0		
Effective from Academic Year			2019-20		Effective for the batch Admitted in			June 2018	
Subject code		1EE2305	Subject Name		ELECTRONIC COMPONENTS AND CIRCUITS				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	1	0	4	Theory	40	60	100
Hours	3	0	2	0	5	Practical	30	20	50

Pre-requisites:
None

Course Learning Outcomes:
<p>The course content should be taught and implemented with an aim to develop different skills leading to the achievement of the following competencies and course learning outcomes:</p> <p>T1. To make aware about analog electronics.</p> <p>T2. To familiarize with the applications of solid state devices.</p> <p>T3. To understand basic electronic equipments and its function.</p> <p>The practical should be carried out in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate course learning outcomes.</p>

Course Content				
Name of UNIT	Unit Content	Unit Learning Outcomes	Marks	Hrs
Semiconductor Diode and its Applications	1.1 Intrinsic and extrinsic semiconductor materials: P type, N type semiconductors 1.2 P-N junction diode: 1.3 Applications - Diode as rectifier, half wave, full wave and bridge wave rectifier 1.4 Need of Filters 1.5 C,L,LC, π filters	1a. Intrinsic and extrinsic semiconductor materials 1b. Working of PN junction diodes 1c. Working of half and full wave bridge rectifier along with sketches 1d. Need for different types of filters 1e. C, L, LC and π filters	14	10
Transistors, voltage & power amplifiers	2.1 PNP and NPN transistors, conduction through transistor leakage current, relationship between α and β 2.2 Transistor configuration & characteristics for CB,CE,CC 2.3 Load line and biasing methods of transistor 2.4 Transistor as an amplifier : CE	2a. PNP and NPN transistors 2b. Working of CB, CE and CC transistors. 2c. Load line and biasing methods of the transistor 2d. Need of voltage amplifier 2e. Voltage amplifier for a particular application 2f. Need of power amplifier	14	12

	<p>amplifier</p> <p>2.5 Cascade amplifiers</p> <p>2.6 Power amplifier: Class A amplifier: Series fed and transformer-coupled amplifier</p> <p>2.7 Class B push-pull Amplifier Operation, Amplifier Distortion</p>	2g. Power amplifier for a particular application		
Oscillators and Other Semiconductor Devices	<p>3.1 Working principle of oscillators</p> <p>3.2 Different types of oscillators: Hartley oscillator, Colpitts oscillator, Phase Shift Oscillator, Wien Bridge Oscillator, Crystal Oscillator</p> <p>3.1 Zener diode, Photo diode, LDR, Photovoltaic Cell, Light Emitting Diode</p> <p>3.3 FET, MOSFET, DIAC, UJT, TRIAC and SCR</p>	<p>3a. Different types of oscillators with relevant sketches</p> <p>3b. Oscillator for different frequency generation</p> <p>3c. Working of the Zener diode, Photo diode, LDR, Photovoltaic Cell, LED with symbols</p> <p>3d. Working of the FET, MOSFET, DIAC, UJT, TRIAC and SCR</p>	20	12
Simple circuit using IC	<p>4.1 Need of I.C.</p> <p>4.2 Operational amplifier (OPAMP).</p> <p>4.3 Characteristic and specification of OPAMP- IC 741</p> <p>4.4 IC 555 timer and applications</p> <p>4.5 Block diagram of IC555 timer</p>	<p>4a. Need of ICs</p> <p>4b. Working of an OPAMP</p> <p>4c. OPAMP IC 741 for a particular application</p> <p>4d. Need of IC 555 Timer</p> <p>4e. Working of a IC555 using the block diagram</p>	06	06
Regulated power supplies	<p>5.1 Regulated power supply (module level), Shunt voltage regulator (module level)</p> <p>5.2 Transistorized series voltage regulator (basic and with feedback, without derivation)</p> <p>5.3 3- Terminal Fixed/variable voltage regulator: 78xx, 79xx, LM317</p> <p>5.4 Switch mode power supply (SMPS)</p> <p>5.5 Uninterruptible power supply (UPS)</p>	<p>5a. Need of regulated DC power supply</p> <p>5b. Working of different types of voltage regulator circuits</p> <p>5c. Voltage regulator for a particular application</p> <p>5d. Working of SMPS</p> <p>5e. Working of UPS</p>	06	05

List of Practical		
No.	Unit	Name of Practical
1	I	Test PN junction diode.
2	I	Test Half wave rectifier using CRO
3	I	Test full wave centre tapped & bridge rectifier using CRO
4	I	Compare output waveform of different Filters using CRO
5	II	Test the performance of CB transistor amplifier
6	II	Test the performance of CE transistor amplifier
7	II	Testing of transistor using multi meter
8	III	Test LED and LDR

9	III	Test Zener diode.
10	III	Test SCR and UJT
11	IV	Identify the pins of IC 741 and IC-555
12	IV	Test the performance of IC 555 timer
13	V	Test Zener diode as voltage regulator
14	V	Build voltage regulator using 78xx and 79xx and measure the dropout voltage for the given voltage regulator.
15	V	Test the performance of SMPS
16	V	Test the performance of UPS

List of Instruments / Equipment / Trainer Board	
1	Regulated power supply: Dual DC , 0-30V/1A & 5V /1A with resolution of 10mV, 2mA
2	Digital Storage Oscilloscope : 300 MHZ Bandwidth , 2GSa/s maximum real time sampling rate refresh rate upto 2000 wfams/s , RS232 & USB connectivity
3	C.R.O. : 30 MHz Bandwidth, 2 channel, 20 ns sampling time
4	Function generator: 10 HZ to 10MHZ , 10 Vpp , rise & fall time =20ns, manual / external triggering
5	Digital Multimeter

List of Reference Books			
No	Title of Reference Books	Authors	Publication
1	Basic Electronics and linear circuits	Bhargava, N.N.	TMH, New Delhi 2012
2	Electronic devices and circuit	Robert Boylestad	PHI, New Delhi 2012
3	Principle of Electronics	Mehta, V.K.	S.Chand, New Delhi 2012
4	Opamp and Linear integrated circuits	Gayakwad, Ramakant	PHI, New Delhi 2010

Link of Learning Web Resource	
1	Electronics work bench
2	www.howstuffwork
3	www.allaboutcircuits.com
4	www.kpsec.freeuk.com