

Branch Name:	Electrical Engineering
Program Code	ET403
Course Name:	ELECTRONIC COMPONENTS AND CIRCUITS
Course Code:	2ET4030304
Pre-requisite Course:	

COURSE OBJECTIVE:

The course content should be taught and implemented with an aim to develop different skills

1. To study concept of basic Semiconductor Materials
2. Demonstrate behavior of different Amplifiers.
3. Identify different IC circuits.
4. To understand Regulated Power Supply concept.

TEACHING AND EVALUATION SCHEME:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)			
Lecture	Tutorial	Practical	Credit	Theory		Practical	
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment
4	-	2	5	60	40	20	30

DETAILS OF COURSE CONTENTS:

Sr No	Topics and Sub-topics	Total Hours	% Weightage
1	BASICS OF SEMICONDUCTOR AND ITS APPLICATIONS 1.1 Properties of Semiconductor and bonds in semiconductor 1.2 Intrinsic and extrinsic semiconductor materials: P type, N type semiconductors. 1.3 P-N junction diode. 1.4 Applications - Diode as rectifier, half wave, full wave and bridge wave rectifier. 1.5 Need of Filters 1.6 Different types of filters: C, L, LC, π filters.	10	20
2	TRANSISTOR AND 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 Amplifier. 2.5 Cascade amplifiers. 2.6 Types of amplifier 2.7 Power amplifier: Class A amplifier: Series fed and transformer-coupled amplifier 2.8 Class B push-pull Amplifier Operation 2.9 Amplifier Distortion	14	25

3	OSCILLATORS 3.1 Working principle of oscillators 3.2 Different types of oscillators: Hartley oscillator, Colpitts oscillator, Phase-Shift Oscillator, Wien Bridge Oscillator, Crystal Oscillator	14	25
4	SEMICONDUCTOR AND OPTOELECTRONIC DEVICES 4.1 Semiconductor Devices: Zener diode, FET, MOSFET, DIAC, TRIAC, UJT and SCR 4.2 Optoelectronic Devices: Photo diode, photo transistor, LDR, Photovoltaic Cell, LCD, LED and optocoupler. 4.3 Seven Segment LED display	10	20
5	REGULATED POWER SUPPLIES 5.1 Need of IC 5.2 Difficulties with unregulated power supply. Need to have Regulated Power Supply. 5.3 Regulated power supply (module level), Shunt voltage regulator (module level). 5.4 Transistorized series voltage regulator (basic and with feedback, without derivation) 5.5 3-Terminal Fixed/variable voltage regulator IC: 78xx, 79xx, LM317 5.6 Switch mode power supply (SMPS). 5.7 Uninterruptible Power Supply (UPS) types and application for critical load.	08	10

REFERENCE BOOKS:

1. Bhargava, N.N., Basic Electronics and linear circuits
2. Robert Boylestad, Electronic devices and circuit
3. Mehta, V.K., Principle of Electronics
4. www.kpsec.freeuk.com
5. www.google.com

LIST OF PRACTICAL:

1	To Test PN junction diode
2	To Test Half Wave Rectifier using C.R.O
3	To Test the Full Wave center tapped and bridge Rectifier using C.R.O
4	Compare output waveforms of different filters using C.R.O
5	Testing of transistor using multimeter
6	Test the performance of CE transistor Amplifier.
7	Test the performance of class B-Push-Pull Amplifier.
8	To Test Hartley Oscillator using C.R.O
9	To Test Colpitt Oscillator using C.R.O
10	To Characteristic of LDR
11	To test zener diode as voltage regulator
12	To read and interpret the data sheet of different electronics components.

Course Learning Outcomes (CLO):

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CLO1	H		M		M			L		L		L	H	H	L
CLO2	L				M								H		L
CLO3	L									L			L	M	
CLO4		L			L			L			L		M		M
CLO5					L							M	M		
CLO6		L				M			L				L	L	M

Mapping of CLOs with Pos & PSOs

H:High, M:Medium, L:Low