

Subject Code: 1ET4030304	Subject Title: Electronic Components And Circuits
Pre-Requisite	--

RATIONALE:

Electronics is becoming a part of electrical systems in the industry/power system. And hence it has become essential for an electrical diploma engineer to have fundamental understanding of the use of various electronic devices and circuits. This course therefore discusses about the construction, working, and applications of various types of semiconductor components, which are basic building block of amplifier, oscillator, switching circuit, wave shaping circuit and power supply. The skills developed in this course are also essential for comprehending the advanced courses in the later semesters.

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. To understand behavior of different Amplifiers.
3. To study 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	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	14	20
2	TRANSISTORS, VOLTAGE & POWER	14	25

	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 Power amplifier: Class A amplifier: Series fed and transformer-coupled amplifier 2.7 Class B push-pull Amplifier Operation 2.8 Amplifier Distortion		
3	OSCILLATORS AND OTHER SEMI CONDUCTOR DEVICES 3.1 Working principle of oscillators 3.2 Different types of oscillators: Hartley oscillator, Colpitts oscillator, Phase-Shift Oscillator, Wien Bridge Oscillator, Crystal Oscillator 3.3 Zener diode, Photo diode, LDR, Photovoltaic Cell, Light Emitting Diode 3.4 FET, MOSFET, DIAC, UJT, TRIAC and SCR	14	25
4	SIMPLE CIRCUIT USING IC 4.1 Need of I.C. 4.2 Operational amplifier and its parameters (OPAMP). 4.3 Characteristic and specification of OPAMP- IC 741 4.4 IC 555 timer and applications 4.5 Block diagram of IC555 timer	06	15
5	REGULATED POWER SUPPLIES 5.1 Regulated power supply (module level), Shunt voltage regulator (module level) 5.2 Transistorized series voltage regulator (basic and with feedback, without derivation) 5.3 Terminal Fixed/variable voltage regulator: 78xx, 79xx, LM317 5.4 Switch mode power supply(SMPS) 5.5 Uninterruptible power supply(UPS)	08	15

COURSE OUTCOME:

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:

1. Understand the of concept of Amplifier.

2. Understand the of concept of Oscillator.
3. Understand the Simple IC Circuits.
4. Understand concept of Regulated Power Supply.

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 Characteristics of LDR
- 11 Identify the pins of IC-741 and IC-555
- 12 To test zener diode as voltage regulator
- 13 To read and interpret the data sheet of different electronics components.

LIST OF REFERENCES:

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