LEVEL IV COURSES

4131 – ELECTRONIC MATERIALS & COMPONENTS

Teaching Schedule Per Week			Progressive Assessment	Examination Schedule (Marks)			
				Theory		Practical Ex.	Total
Lectures	Practical	Credits					
3	-	3	25 -	3 Hrs	100	-	125

Pre-requisite	Source
Nil	EXN

Semester	Theory	Test	Total	TW	PR	Gr Total

Rationale:- This basic course involves study of various electronic components and materials. Their properties and characteristics are essential for general awareness.

COURSE CONTENTS	Hrs	Mks
1. ELECTRONIC MATERIALS		
Conductors: High conductivity materials, high resistively materials with examples, their properties and applications.	4	10
Insulators: Dielectrics, polarization, dielectric constant, dielectric loss, dielectric break down, various commonly used dielectric materials and their general Properties.	4	10
Resistors: Various types, fixed and variables, wire-wound, metal film, carbon film, characteristics constructions and applications of each type of resistor, thermistor, LDR, VDR, typical materials used in manufacture of resistors, brief idea about manufacture of resistors, colour codes of resistors. Comparison between various resistor types, testing and measuring resistance values.	6	10
Capacitors: Various types, fixed and variable, ceramic, mica, paper, electrolytic, precision, trimmer capacitors. Specifications, characteristics, construction and application of each type. Colour codes of capacitors, testing and measuring capacitors.	6	10
Magnetic Materials: Magnetic materials and their characteristics, hard and soft magnetic materials. Ferrites and their applications. Inductor, fixed and variable, specifications, Materials used in the manufacture, winding techniques. Transformer, types specifications and their applications, constructions and testing of transformers.	4	10
Batteries, Microphones and Speakers: Batteries: types, specifications, construction and their applications. Microphones: Types, specifications, construction and their applications.	4	10
2. RELAYS CABLES CONNECTORS AND SWITCHES		
Relays: Principle of operation of electromagnetic and solid state relays. Constructions, characteristics of different types like general purpose, reed, telephone and polarized relays, important specifications. Testing of relays.	6	10
Cables and Wires: Types of cables, characteristics, construction and application of power, communication and coaxial cables. Wires, types, sizes, and ratings and materials used for their manufacture.	4	10
Switches and connectors: Switches, types, characteristics, toggle, rotary, keyboard, push button, connectors, types, characteristics, edge connector, RF connectors, BNC connectors, etc.	4	10
PCB and Soldering: Need for PCB, materials used, general consideration in layout, artwork, preparation and manufacture of single sided double sided and multi-layer PCB. Soldering techniques, hand soldering and mass soldering in brief, and precautions in soldering. Solder alloys and flux material.	6	10
Total	48	100

TEXT /REFERENCE BOOKS:

1. Electronic Components and Materials by Madhuri Joshi.
2. Electronic Materials and Components by Patil, Deshmukh & Vaidya.
3. Electrical and Electronic Handbooks