

GUJARAT TECHNOLOGICAL UNIVERSITY

NAME OF COURSE : ELECTRONIC PRACTICES

1. RATIONALE :-

This course is aimed at providing knowledge of working of simple circuits & Fabrication of PCBS soldering practice, study of electronic work bench etc. The course covers preparation of simple PCB, drilling of holes, soldering technique and surfing through internet for datasheets of different components. This course is useful in the project and setting up of many experiments in other basic technology and applied technology courses.

2. LABORATORY EXPERIENCIES :

1. Electronics Accessories

1.1 Wires & Cables

- 1..1.1 SWG
- 1..1.2 Single core
- 1..1.3 Multi core
- 1..1.4 Single strand
- 1..1.5 Multi strand and their types
- 1..1.6 Armed cable
- 1..1.7 Shielded wires
- 1..1.8 Coaxial cables
- 1..1.9 Twisted pair
- 1..1.10 Flat ribbon cable
- 1..1.11 Teflon coated wires
- 1..1.12 Different types of Fiber cables

1.2 Connectors

- 1.2.1 BNC
- 1.2.2 TNC
- 1.2.3 Banana pin connector
- 1.2.4 D connector
- 1.2.5 FRC connector
- 1.2.6 Relimate
- 1.2.7 Burg strip
- 1.2.8 Edge connector
- 1.2.9 Euro connector
- 1.2.10 Power connector
- 1.2.11 SMA connector
- 1.2.12 RJ-45 connector
- 1.2.13 RJ-11 connector
- 1.2.14 JACK pin connector-Mono stereo

1.3 Fuses

- 1.3.1 Glass
- 1.3.2 Ceramic fuse
- 1.3.3 Resetable fuse
- 1.3.4 Shunt fuse- MOV
- 1.3.5 HRC fuse

1.4 Switches

- 1.4.1 Toggle switch- SPDT, DPDT,TPDT
- 1.4.2 Centre off, Without centre off
- 1.4.3 Rotary switch types depending on their poles and positions

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- 1.4.4 Rocker switch
- 1.4.5 Push button latch and non latch
- 1.4.6 Tactile switch
- 1.4.7 Micro switch
- 1.4.8 Limit switch
- 1.4.9 DIP switch
- 1.4.10 Thumb wheel switch- BCD, Decimal
- 1.4.11 Membrane switch

1.5 Relays

- 1.5.1 Electro magnetic relay and their types according to their coil voltage and contacts
- 1.5.2 Reed & Reed relay
- 1.5.3 Semi conductor relay
- 1.5.4 Solid state relay
- 1.5.5 Contactors

1.6 Transformer

- 1.6.1 Step up
- 1.6.2 Step down
- 1.6.3 Center tapped
- 1.6.4 Current transformer
- 1.6.5 Pulse transformer
- 1.6.6 Audio transformer
- 1.6.7 Auto Transformer
- 1.6.8 R.F. Transformer, I.F. Transformer

2. Electronics Components

- 2.1.1 Resistor
- 2.1.2 Carbon composition Resistor
- 2.1.3 Carbon film resistor
- 2.1.4 Metal film resistor
- 2.1.5 Wire wound, Fusible resistor
- 2.1.6 1/8w, 1/4w, 1/2w, 1w, 2w, 5w
- 2.1.7 Fixed & Variable Potentiometer-preset-multi turn-trim pot wire wound, sliders
- 2.1.8 Colour codes

2.2 Inductor

- 2.2.1 Wire indicator- Air core
- 2.2.2 Ferrite core
- 2.2.3 Axial lead inductor

2.3 Capacitor

- 2.3.1 Electrolytic
- 2.3.2 Ceramic
- 2.3.3 Polyester
- 2.3.4 Metallized polyester
- 2.3.5 Tantalum, mica
- 2.3.6 Ceramic
- 2.3.7 Paper capacitor
- 2.3.8 Gang capacitor- trimmer capacitors

2.4 Semi conductor component

- 2.4.1 Diode
- 2.4.2 Transistor

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- 2.4.3 LED
- 2.5 SMD components
 - 2.5.1 Resister
 - 2.5.2 Capacitor
 - 2.5.3 Diode
 - 2.5.4 Transistor
 - 2.5.5 Heat Sink
 - 2.5.6 I.C. Packages
- 2.6 Component packages
 - 2.6.1 DIP
 - 2.6.2 SIP
 - 2.6.3 TO-92
 - 2.6.4 TO-3
 - 2.6.5 TO-5
 - 2.6.6 TO-220
- 2.7 Memory equipment
 - 2.7.1 CRO
 - 2.7.2 Multimedia
 - 2.7.3 DMM
- 2.8 PCB-Introduction
 - 2.8.1 Types
 - 2.8.2 Single sided
 - 2.8.3 Double sided
 - 2.8.4 Multi layer
 - 2.8.5 Strock-PTH

3 Wiring & Testing of simple electronics circuit

- 3.1 Bread board
 - 3.1.1 Series & parallel connection of Resister on bread board
- 3.2 Soldering
 - 3.2.1.1 Solider iron- Use and its characteristics
 - 3.2.1.2 Soldering station
 - 3.2.1.3 Good soldering & bad soldering
 - 3.2.1.4 Difficulties of dry soldering
 - 3.2.1.5 Zero defect soldering
 - 3.2.1.6 Soldering material
 - 3.2.1.7 Series and parallel connection of resister, capacitors
 - 3.2.1.8 SMD soldering and tools
 - 3.2.1.9 Liquid Flux
 - 3.2.1.10 Use of Thinner to clean Soldering contacts
- 3.3 De-soldering
 - 3.3.1 De-soldering pump
 - 3.3.2 Hot air gun
 - 3.3.3 De-soldering station
 - 3.3.4 SMD rework station

4. Literature survey & Industrial visit

- 4.1 Use of data Book for component data sheets.
- 4.2 Use of Internet surfing for component data sheets

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5. TERM WORK :-

This shall consist of the prescribed jobs as under, duly certified.

1. Writing circuit on bread board	4 Jobs
2. Writing circuits on General purpose PCB	2 Jobs
3. Soldering on PCB	2 Jobs
4. De Soldering from PCB	1 Jobs
5. PCB Drilling, Connector crimping	1 Jobs
6 SMD Soldering and Desoldering	2 Jobs

Total	12 Jobs