

**SHORT-TERM VOCATIONAL CERTIFICATE  
COURSES (6 MONTHS DURATION)  
IN**

**STATE INSTITUTE OF VOCATIONAL EDUCATION  
AND  
BOARD OF INTERMEDIATE EDUCATION  
ANDHRA PRADESH:HYDERABAD**

# INDEX

## **S. No. Name of the Course**

### **A. Syllabus**

#### **1. AGRICULTURE**

#### **2. ENGINEERING & TECHNOLOGY**

1. Plastic Technology

2. Auto Electrician

3. Electrician

4. Plumbing

5. Welding

6. Carpentry

#### **3. COMPUTER SCIENCE**

1. Certificate Course in Computer application

2. Certificate Course in Information Technology

3. Data Entry

4. Advanced Multimedia, Graphic and Animation

5. Hardware Technology

#### **4. HOME SCIENCE**

1. Bakery and Confectionary

## **I. AGRICULTURE**

# **GARDENER TRAINING COURSE**

## **( Six months Certificate Course)**

### **1. Introduction**

There is in India at the present moment a wide spread and increasing interest in gardens. There is an increasing demand for trained gardeners and garden superintendents, literate, scientifically trained men who can make gardens look well and pay handsomely. The required vocational education and training in GARDEN TRAINING is intended to be imparted through two modules. The first module deals with the principles adopted in laying out gardens, the components of modern garden and how they are formed, and several garden operations, such as the preparation of land propagation of plants etc. The second module contains descriptive lists of select plants that are commonly grown in our gardens or are worth growing.

### **2. Objectives of the Course**

1. To provide training in practical management of ornamental gardening and landscaping.
2. To provide technical skills to the students to establish and manage a small commercial horticulture enterprise.
3. To provide training in the vegetative propagation of horticultural crops.
4. To provide training in the production of fruits, vegetable, flower, bedding and foliage plants.

### **3. Skills to be Provided**

- i. Identification of garden problems - nature and extent.
- ii. Identification of crops
- iii. To impart basic techniques in gardening.
- iv. To do various preparation methods like sowing, planting and raising nursery.
- v. Acquaintance with garden tools and equipment.
- vi. Layout and maintenance of gardens and lawns.
- vii. Acquaintance with package of practices on farm.
- viii. To propagate the plants by various methods.

### **4. Employment Opportunities**

#### **A) Wage Employment**

- i. Garden Supervisor
- ii. Gardner
- iii. Garden Assistant

iv. Plant Observer

**B) Self Employment**

i. Nursery man

ii. Orchard grower

Modules	Theory		On-the-job training		Total	
	Hours	Weightage	Hours	Weightage	Hours	Weightage
Module - I	72	30	216	70	288	100
Module - II	72	30	216	70	288	100
<b>Total</b>	144	60	432	140	576	200

**V. Scheme of instruction per Week**

	Theory	On-the-job Training	Total
Module I / II	6 Hours	18 Hours	24 Hours

S. No.	Major Topics	No. of Hours
1.	Introduction to Gardening	01
2.	Garden implements and accessories	02
3.	Area, measurements, layout, planning designing	04
4.	Containers	02
5.	Propagation	03
6.	Types of gardening	03
7.	Identification of ornamental plants	04
8.	Features of gardens	11
9.	Principles and practices of landscape design for home gardens and public parts	08
10.	Ornamental gardening	10
11.	Design and layout of gardens	10
12.	Green Houses	04
13.	Pruning and training	04
14.	Principles of making bonsai	06
	<b>Total</b>	<b>72</b>

## **Theory (72 Hours)**

1. Introduction to Gardening
2. Garden Implements and Accessories
3. Area, Measurements, Volumes, Layout - Planning, Different Designs.
4. Containers - Earthen containers, pots, polybags, cement pots, ceramic pots.
5. Propagation - Seeds, cuttings, layering, budding and grafting
6. Types of Gardening - Formal, informal, landscape, institutions, public gardens, parks, Hindu, Mughal, Japanese and English Gardens.
7. Identification of ornamental plants, seasonal annuals, edges, hedges, shrubs, creepers, trees, vines (commercial nursery)
8. Features of Gardens - Gate, lawn, shrubbery, flower beds, borders, paths, hedges, edges, steps, statues, fountains, bird paths, streams, pools, water falls, rockery, arches, pergolas, hanging pots, bird paths, tea house.
9. Principles and Practices of landscape design for home gardens and public parks.
10. Ornamental Gardening - Scope; importance; nursery management; lawns, layout of lawn, grasses; lawn and its maintenance.
11. Design and layout of gardens for home, school, college, public buildings, parks, villages and kitchen garden.
12. Green Houses-shade houses, uses, application in horticulture.
13. Pruning and training - objective and methods.
14. Principles of making bonsai.

## **On the Job Training ( 216 hours)**

1. Study Garden tools and implements
2. Study of containers - earthen containers, pots, polybags, cement pots and ceramic pots.
3. Preparation of nursery beds and sowing of seeds.
4. Layout of land for lawn.
5. Preparation of land for lawn.
6. Designing of home gardens
7. Planting of woody plants, bulbs and bedding plants.
8. Planting of shrubbery, hedges and edges.
9. Identification and growing of indoor plants of their basic requirements.
10. Practice in making bonsai.

11. Raising of root stocks for grafting and budding.
12. Propagation of plants through cuttings.
13. Practicing of layering and stooling (Guava)
14. Practicing of grafting (Mango)
15. Practicing budding in rose / citrus.
16. Visit to commercial nursery in the locality.
17. Preparation of potting mixture, potting and repotting.
18. Study or ring basin method in an mango / citrus orchard.
19. Study of check basin method in vegetables.
20. Study of sprinkler irrigation method.
21. Study of drip irrigation method.
22. Layout of model kitchen garden.
23. Planning and designing of different of gardens

## Module - II

### a) Theory (72 hours)

S. No.	Major Topics	No. of Hours
1.	Cultivation of fruit crops	20
2.	Cultivation of vegetable crops	18
3.	Cultivation of flower crops	15
4.	Cultivation of bedding plant, bulbs, pot plants and aquatic plants.	11
5.	Study of foliage plants	08
6.	<b>Total</b>	<b>72</b>

### Theory (72 hours)

1. **Cultivation of Fruit Crops** like Mango, Sapota, Guava, Citrus and Pomegranate with special reference to selection of site, infrastructure required for plantations; nurseries for raising plant material, varieties, spacing, propagation, planting, training, pruning, weed control, plant protection etc.
2. **Cultivation of Vegetable Crops** like Tomato, Brinjal, bhendi, Chillies, Cabbage and Cauliflower, Palak and gourds.
3. **Cultivation of Flower Crops** like Rose, Jasmine, Chrysanthemum, Marigold and Tuberose.

**4. Cultivation of Beeding Plants,** Bulbs, pot plants and Aquatic plants.

**5. Study of Foliage Plants**

**On the Job Training (216 Hours)**

1. Identification of fruit crops.
2. Digging and refilling of pits for planting of fruit crops.
3. Interculture operations in fruit trees.
4. Methods of training in grapes.
5. Methods of pruning in grapes / pomegranate.
6. Application of manures and fertilizers for fruit crops.
7. Identification and control of insect pests for fruit crops.
8. Identification and control of diseases in important fruit crops.
9. Participation in harvesting of fruit crops.
10. Visit to orchards.
11. Identification of vegetable seeds.
12. Preparation of land beds for important vegetable crops.
13. Preparation of nursery beds for important vegetables.
14. Participation in transplanting of vegetable seedlings in main field.
15. Use of manures and fertilizers as basal application of important vegetable crops.
16. Inter-culture operations like hoeing, earthing and staking in tomato.
17. Identification of important insect pests of vegetables and their control.
18. Identification of important diseases of vegetables and their control.
19. Participation in harvesting of vegetable crops.
20. Identification of commercial flowers.
21. Training and pruning in rose.
22. Practicing garden operations such as staking, pinching, de-suckering in cut flowers.
23. Practicing of fertilizer application to cut flowers.
24. Practicing pruning in jasmine.
25. Identification of diseases and insects and their control in important flower crops.
26. Identification of annuals, bi-annuals and perennials, bulbs and pot plants.

27. Identification of landscape trees, shrubs / climbers and ground covers.

28. Visit to commercial nursery.

## VII. List of Tools and Equipments

### a) Digging tools

1. Spade - 10, 2. Garden Forks - 4

### b) Tools for interculture operations

1. Weeding fork - 04, 2. Hoe - 4

### c) Appliances for watering

1. Water can - 6, 2. Seedling water can - 4  
3. Bucket - 4, 4. Syring - 2  
5. Garden hose 2, 6. Sprinkler - 1  
7. Drip unit - 1

### d) Pruning Tools

1. Secateur - 4 2. Trace pruner - 2  
3. Garden knives - 4 4. Bill hook - 1  
5. Pruning saws - 2 6. Gardenshears - 4  
7. Lawn mower - 1 8. Grass shears - 4

### e) Rakes

1. Garden rake - 4 2. Lawnrake - 4

### f) Sowing and planting :

1. Trowels - 2 2. Dibbers - 1  
3. Hand forks - 4

### g) General garden equipment :

1. Wheel Barrows 2 2. Baskets - 5  
3. Roller 1 4. Pickaxe - 2  
5. Shovel 1 6. Sieves - 4  
7. Labels 500 8. Garden gloves - 4

### h) Typing and supporting material

1. Typing material as per requirement  
2. Supporting material as per requirement

3. Lattice 4. Wire screen as per

5. Ladder 1

**i) Post and trays 20**

**j) Sprayers and dusters**

- |                      |   |                 |     |
|----------------------|---|-----------------|-----|
| 1. Knap sack sprayer | 1 | 2. Stirrup pump | - 1 |
| 3. power sprayer     | 1 | 4. Hand duster  | - 1 |

**k) Charts showing symptoms of pests and diseases. - 20**

**i) Charts showing different methods of pruning and training - 20**

**m) List of field facilities**

1. Well protected orchard with important fruit crops.
2. Lawn
3. Nursery
4. Land with irrigation facilities to grow annual crops, flowers and vegetables.
5. Bullocks (pair) 1
6. Wooden leveller 1
7. Water tanker 1
8. Seed drill 1
9. Iron plough 2
10. Cultivators 1
11. Blade Harrow 1

**VIII. SUGGESTED LIST OF COLLABORATING INSTITUTIONS**

1. Orchards - Public or Private
2. Vegetable gardens - Public or Private
3. Department of Horticulture.
4. ANGR Agricultural University
5. Departmental farms / nurseries
6. Research stations of the Universities and ICAR institutions.
7. Nurseries
8. Municipal corporations.
9. Flower growers, florists and hotels.
10. Gardens and parks

**IX. Qualification for Teaching Faculty**

M.Sc. (Horticulture) / M.Sc. (Agriculture) with 2years experience /  
B.Sc. (Horticulture) with 4 years experience.

**X. Reference Books**

1. Complete Gardening India - K.S.s Gopalaswamiengar
2. Gardening in India - Bose T. K. and Mukherjee
3. Design Elements of Landscape Gardening - Nambisan K.M.P.
4. Text-Book of Horticulture - Rao K. M.
5. Fruits-topical and sub-tropical - Bose, T.K. and Mitra, S. K.
6. Vegetables - Chaudhary, B.
7. Floriculture in India - Randhawa, G.S. & Mukhopadhy. A.

**XI. List of Participants**

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# **SYLLABUS**

## **II. ENGINEERING TECHNOLOGY**

- 1. Plastic Technology**
- 2. Auto Electrician**
- 3. Electrician**
- 4. Plumbing**
- 5. Welding**
- 6. Carpentry**

# 1. PLASTIC TECHNOLOGY

## 1. Introduction

When a large number of molecules from a monomeric state lie together, from a long chain polymeric material, Polymers : Poly - many; Mers - molecules parts. Today's modern time is well considered as the plastic age where a unlimited number of polymers either unmodified or modified are being offered by raw material manufacturers which are broaden the avenues for a wide variety of application's and obviously replacing the long establish materials day by day without facing challenge.

A wide range of plastic materials which are available can be categorically divided into three groups like thermo set plastics, thermoplastics and these are modified plastics, filled and reinforced plastics, blends & alloys up to a new generation plastics called, "Liquid crystal polymers".

After curing the thermo set mould it is rigid and hard and insoluble in moulded chemicals, thermos plastics can be remolded or reshaped several times subject to the limits of thermal fatigue and degradation polymeric materials are susceptible to oxidative degradation during processing under heat and pressure.

## 2. Objectives

1. The trainee able to operate all types of plastic machinery and equipment.
2. The trainee shall be liable to Injection moulding of mugs, glasses, trays, buckets, brief cases, suitcases, electrical components, computer cabinets, TV cabinets, all electronic equipment is plastics etc.
3. Blow moulding; bottles, beakers, All sizes.
4. Extrusion moulding; film plant, films, carrying bags, straws, PVC pipes in different sizes, profiles etc.
5. Compression moulding ; Electrical switches, electrical contacted, knobs, handles, plates, utensils, etc.

## 3. Skill oriented Information for different type of machines

1. Setting of machine and mould
  - i. Check whether the control lever is in neutral position.
  - ii. Check the oil level of the tank
  - iii. Check whether the motor runs in the direction of the arrow-clockwise sun from the ventilator
  - iv. Check whether the motor is connected according to the electric circuit diagram.
  - v. Check whether the pressure regulation is relieved.

## 2. Operating Procedures

- i. Heat the mould according to desired range of temperature.
- ii. As the mould closes it takes the shape of cavity.
- iii. Clear the cavity and mould surface by air jet.

## 3. Semi automatic cycle

## 4. Preparation for operation

- i. Cleaning of parts
- ii. Lubrication of parts
- iii. Checking the operation of electrical circuit.
- iv. Checking the cooling water system.
- v. Mount the extruder screw
- vi. Mount the die
- vii. Set the temperature

## 5. Shutdown procedure

- i. Put the heaters and switch off his mares.
- ii. Purge the material with clear PS ( POLYSTYRENE)
- iii. Remove screw, die head and clean it.
- iv. Refit the same in the machine

## 4. Employment Opportunities

A trainee after completing this course successfully he is able to start on his own i.e., self employed or can be employed on wage basis depending upon the skill he has.

## 5. Syllabus

### MODULE - I

12 x 6 = 72

1. Importance of safety and general precautions observed in the section. Importance of trade in the development of industrial economy of the country - working systems of industry.
2. Plastic processing machinery, injection moulding machining description and use different parts, their function, types - Metal - Ceramic - Earth, properties, uses.
3. Polymer substances- definition of wood, plastics, rubber, body tissues, etc.
4. Groups of Plastics - thermo plastics - properties, uses - applications
5. LDPE, HDPE - properties, use, applications.
6. Polypropylene, Nylon, Nylon - 6, Nylon - 66, properties use and application, moulding defects and their remedies.

7. Thermosetting group of plastics phenol formaldehyde resin and urea formaldehyde resin properties, use and applications.
8. Processing technique of low and high density polyethylene PF and UF resin, preventive maintenance of machinery process of oiling and lubrication.
9. Compression moulding machine - description, different parts and their respective function. Styrene group of plastic polystyrene their properties uses and its applications.
10. Styrene group of plastics - ABS and SAN - their properties, uses and applications.
11. Styrene group of plastics - acetyl homo polymer, copolymer, their group, properties and use, MF resin its properties and applications
12. PVC =- flexible and rigid - their properties and use.

## **MODULE - II**

**12 X 6 = 72**

13. SMC & DMC group of thermosetting groups of plastics, their properties and use and its application
14. Acrylic polycarbonate their properties use and application, processing technique of different plastic material, moulding defects and their remedies.
15. Preventive maintenance of compression moulding machine technique of oiling and lubrication.
16. Extrusion machine its description and use, different parts and their functions, cellulose description its properties and use.
17. Cellulose acetate, cellulose nitrate and cellulose CAB - their description and use.
18. Processing techniques of different plastic materials, moulding defects and their remedies.
19. Thermoplastic, PET, PBT, polybutylene, terephthalate, PET-P
20. Polyethylene, terephthalate - their description - properties and use of polyester resin its properties.
21. Epoxy resin its properties and use processing techniques of different plastic material.
22. Hydraulic functions - its application in plastic processing machine - preventive maintenance of extrusion machine.
23. Blow moulding machine - its description different parts and their respective function sequence to be followed in operating the machine.
24. Brief description of filled thermo plastic (reinforced) and their properties, use and advantages, silicon resin, its properties and use, processing technique of different plastic material.
25. Foamed plastic - its properties, use and application processing techniques of different plastic material.
26. Testing and quality control with respective materials.

## Syllabus

### PRACTICAL - I

12 x 18 = 216

1. Familiarisation with the institute. Importance of trade training. Machinery used in trade. Introduction to safety equipment and their use.
2. Familiarisation with the basic idea of mechanical, electrical and hydraulic systems of injection moulding machine and its different parts and their respective function.
3. Operating and controlling of injection moulding machine in IRO (Ideal run operation). Fitting of mould injection, locking and cooling of mould
4. Operating and controlling of injection moulding machine in IRO - adjusting feed of screw or room temperature, controlling, fitting and adjusting nozzle, adjusting injector, pressure and speed.
5. Operating and controlling of injection moulding machine in TRO (Trial run operation) using low density polyethylene (LDPE)
6. Operating and controlling of injection moulding machine in TRO using thermoplastic material as available (HDPE), (PD), etc.
7. Operating and controlling of injection moulding machine in TRO using thermosetting material as available.
8. Oiling, lubrication and preventive maintenance of injection moulding machine
9. Familiarisation with basic idea of mechanical electrical and hydraulic system of compression moulding machine and its different parts and their respective functions.
10. Operating and controlling of compression moulding machine in IRO (Movement of platen top and bottom adjustment and control adjusting)
11. Operating and controlling of compression moulding machine in IRO (Pressure in terms of per square area and total tonnage checking of bulk factor, density, etc.)
12. Operating, controlling of compression moulding machine in TRO using thermo plastic material as available.

### PRACTICAL - II

12 X 18 = 216

13. Operating, controlling of compression moulding machine in TRO using thermosetting plastics as available.
14. Operating, controlling of compression moulding machine in TRO using thermosetting plastics as available (MF, UF)
15. Oiling, lubricating and preventive maintenance of compression moulding machine.
16. Familiarisation with basic idea mechanical, electrical and hydraulic systems of extrusion machine and its different parts and their respective functions.
17. Operating and controlling of extrusion machine in IRO.
18. Adjusting variable speed setting and adjusting die head for profile and film, etc.
19. Operating and controlling of extrusion machine in IRO

20. Operating and controlling of extrusion machine in TRO and using thermoplastic material as available.
21. Operating and controlling of extrusion machine in TRO using thermoplastic material as available
22. Oiling, lubricating and preventive maintenance of extrusion machine.
23. Familiarisation with basic idea of mechanical and hydraulic system of hand blow moulding and its different parts and their respective functions.
24. Operating and controlling of semi automatic blow moulding machine in IRO (setting of die, adjusting mandrel) controlling of parirun, adjusting thickness uniformity.
24. Operating and controlling of automatic blow moulding machine in TRO using thermoplastic and thermosetting plastic as available. Preventive maintenance of automatic blow moulding machine
26. Testing and mechanical properties of operating testing of plastic material.

## **6. List of Machinery / Equipment**

1. Hand injection machine in required dies
2. Automatic injection moulding machine [hand, semi and fully automatic]
3. Blow moulding [hand operated machine]
4. Blow moulding [semi and fully automatic machine]
5. Extrusion Machine : Film plant, pipe plant, reprocessing unit, etc.
6. Compression moulding machine [Hand, semi and fully automatic]
7. Scrap grinder
8. Dry oven
9. Air compressor
10. In required and suitable dies

## **7. Raw Materials**

### **Consumables**

1. Low density polythelene (LDPE)
2. High density polythelene (HDPE)
3. polythelene (PP)
4. Acrylonitrile - butadiene styrene (ABS)
5. Nylon - 6, Nylon - 66
6. Urea formaldehyde (UF)
7. Phenol formaldehyde (PF)
8. Melamine formaldehyde (MF)
9. Resin
10. Epoxy

## 8. Reference Books

1. Learning package for plastic processing operator by Central staff training and research institute
2. Engineering properties of thermoplastics - R.M. Ogorkie
3. Text book of polymer science - F.W. Billimeyer
4. Injection moulding - Athalye
5. Plastics Extrusion Technology - Grift
6. Plastics forming - Beadle
7. Compression and transfer moulding - Bobb
8. Introduction to plastics processing - CIPET, Guindy
9. Principles of plastics extrusion - J.A. Brydson
10. Plastics technology - Milbey

## List of Participants

1. V. Anil Kumar Naidu  
Asst. Training Officer, ITI  
Mallepally, Hyderabad.
2. V. Radha Krishna  
Asst. Training Officer, ITI  
Mallepally, Hyderabad.

## 10. Syllabus Reference

DGE & T [ Director General Employment and training]

## FACULTY

1. Diploma in Mechanical Engineering with experience
2. Certificate holder in Plastic Technology with experience.
3. Diploma in Mech. Engg. with 5 years experience in Plastic Industry is preferable.

## Scheme of Instruction

Modules	Theory		On-the-job training		Total	
	Hours	Weightage	Hours	Weightage	Hours	Weightage
Module - I	72	30	216	70	288	100
Module - II	72	30	216	70	288	100
Total	144	60	432	140	576	200

## V. Scheme of instruction per Week

	Theory	On-the-job Training	Total
Module I / II	6 Hours	18 Hours	24 Hours

Module - I Plastic Materials

Module - II Plastic Processing Procedure

Practical - I Equipment operating Lab

Practical - II Operating and Controlling Lab

## 2. Auto Electrician

### 1. Introduction

This course aims in imparting knowledge to the students in the field of automobile electrician.

### 2. Objective

To equip themselves in the field of Automobile industry/workshops

### 3. Skills to be provided

1. To learn about the various electrical wiring in Automobile vehicles
2. To learn about the construction and working of dynamo's
3. To learn about the faults and remedies of dynamo's
4. To learn about the construction and working of alternators
5. To learn about the faults and remedies of alternators
6. To learn about the construction of battery
7. To learn about the working of battery
8. To learn about the defects and remedies of battery
9. To learn about the battery charging
10. To learn about the construction and working of wipers.
11. To learn about the defects and remedies of wipers.
12. To learn about the defects in lighting system
13. To learn about the construction and working of hours.
14. To learn about the defects and remedies of horn.
15. To learn about the construction and working of electric steering.
16. To learn about the defects and remedies of steering

### 4. Employment Opportunities

- a. On wage at manufacturing center's of automobiles
- b. Self employment by setting up of independent workshops

### 5. Syllabus

#### MODULE - I

6 x 12 = 72

1. To teach about various electrical circuits in a vehicle.
2. To teach about the construction of battery.
3. To teach about the working of battery.
4. To teach about the construction of dynamos
5. To teach about the working of dynamos and Revision

**MODULE - II****6 x 12 = 72**

6. To teach about the construction of alternator
7. To teach about the working of alternator
8. To teach about the construction of electrical horn
9. To teach about the working of electrical horn
10. To teach about the construction of wiper
11. To teach about the working of wiper
12. To teach about the construction and working of self .....

**OJT - I****12 x 18 = 216**

1. To show the method of connecting battery to charger
2. To show the method of connecting battery to Vehicle
3. To show the method of testing battery with hydrometer
4. To show the method of testing battery with cell tester
5. To show the method of adjusting belt tension.
6. To show the method of dismantling dynamo
7. To show the method of testing dynamo components.
8. To show the method of dismantling alternator
9. To show the method of testing alternator components
10. To show the method of dismantling electrical horn
11. To show the method of testing electrical horn
12. To show the method of assembling of horn

**OJT - II****12 x 18 = 216**

13. To show the method of dismantling of wiper
14. To show the method of assembling of wiper
15. To show the method of testing wiper
16. To show the method of connecting head lamps and packing lamp
17. To show the method of connecting ignition circuit.
18. To show the method of connecting horn circuit.
19. To show the method of connecting wiper
20. To show the method of connecting accessories, such as roof light, lighter's power windows and doors, luggage compartment.
21. To show the method of detecting faults in battery.
22. To show the method of detecting faults in dynamo.
23. To show the method of detecting faults in alternator
24. To show the method of detecting faults in horn.
26. To show the method of dismantling and testing of self M starter
27. To show the method of testing of ignition System.

## 6. List of Equipment

1. Battery charger (selenium type)

## 2. Megger

3. Wiring mock up board indicating different electrical circuits such as starting, ignition, horn, charging power windows and doors.

## 7. Raw Material

1. Low tension wires 3 mm, 5mm of different colours
2. Anodes, diodes, resistors, battery terminals, lugs.

## 8. Books of reference

Manuals of different makes of car manufacturers, mini vans, trucks, such as Maruti, Toyota Qualis, Opel Astra, Voyager etc.

## 9. List of participants

Md. Ghouse Mohinuddin  
Training Officer Retd.  
I.T.I. Mallepally,  
Hyderabad

## 10. Faculty

1. Diploma in Automobile Engineering
2. Trade Certificate in Auto Electrician with 3 years experience

## Scheme of Instruction

Modules	Theory		On-the-job training		Total	
	Hours	Weightage	Hours	Weightage	Hours	Weightage
Module - I	72	30	216	70	288	100
Module - II	72	30	216	70	288	100
Total	144	60	432	140	576	200

## V. Scheme of instruction per Week

	Theory	On-the-job Training	Total
Module I / II	6 Hours	18 Hours	24 Hours

Module - I : Auto Electrical Equipment

Module - II : Auto Electrical System

Practical - I : Electrical Lab

Practical - II : Auto Electrical System Lab

### 3. ELECTRICIAN

#### 1. Introduction

Directorate of Intermediate Education creating Excellent opportunities for the School dropouts and Xth failed candidates, by introducing Short-term courses in various fields, which develops the self-ability. These courses not only develops self-ability but also provides self-employment opportunities.

#### 2. Objectives

The objectives of the Electrician Course is to train the students in the following topics

1. To develop the concept on the principles of Electrical engineering.
2. It develops full knowledge about the wiring. The Trainee can able to do any type of wiring.
3. He can able to prepare Estimation.
4. He can able to repair various domestic Appliances
5. He can able to do the winding of various motors.

With these above objectives this electrician course provides Self-Employment and avoids Un-employment

#### 3. Skills to be provided :

- a) The student should be able to calculate Electrical billing.
- b) He should be able to test the energy meter.
- c) He should be able to do any type of wiring
- d) He should be able to repairing and charging of batteries.
- e) He should be able to prepare the Estimation for wiring
- f) He should be able to repair domestic appliances.
- g) He should be able to do different types of windings.

#### 4. Employment Opportunities :

After completion of this course the Trainee can set up his own work-shop. He can take up all types of Electrical works and repairs of various electrical appliances and rewinding of motors, Table and Ceiling fans etc., He can do any type of wiring.

Besides this he can also appear for wireman examination for getting licenciated certificate in the Electrician trade.

## 5. Scheme of Instructions :

	Theory	Practical	Total
Module - I	72 Hours	216 Hours	238 Hours
Module - 2	72 Hours	216 Hours	288 Hours
Total	144 Hours	432 Hours	576 Hours

**Faculty :** Diploma in Electrical & Electronics Engg. 2 winder with 5 yrs. experience

**Course : Electrician**

**Duration : Six Months  
(2 Modules)**

### Electrician

**Module Subject - I**

### Electrical Wiring

Total periods : 72

Periods per week : 06  
Max Marks 30

### Major Topics

S. No.	Topic	No. of Periods Alloted
1.	Basics of Electrical Engineering	9
2.	Safety precautions - First Aid	4
3.	Wiring Instruments - Accessories	9
4.	Cables - wire Jointing	9
5.	Wiring Systems - House Wiring-Circuits	15
6.	Earthing	4
7.	Wiring Tests - IE. Rules	4
8.	A. C. Starters	9
9.	Estimation	9
	Total	72

### 1. Basics of Electrical Engineering

- 1.1 OHM's Law : Electric current - conductors - insulators Semit-conductors-Electric potential-Resistance-Ohm's Law - Resistances in series and parallel simple problem.
- 1.2 Work-power-Energy : Definitions of work, power & energy simple problems on power & energy - problems on energy consumption and monthly billing- DC, A.C. power

1.3 Cells : primary cells - secondary cells - lead acid cell construction and working - efficiencies of cells defects in cells - charging methods - maintenance.

## **2. Safety Precautions - First Aid**

Precaution to be taken of various stages (while handling tools, during wiring etc) - electric fire-precautions against shocks-first aid artificial respiration.

## **3. Wiring instruments - Accessories**

3.1 Wiring instruments : uses, sizes and handling precautions of various wiring tools (screw driver, combination plier, Hammer, chisels, hacksaw, die set wire gauge etc.)

3.2 Wiring Accessories : Switch, various types different types of switch boards - lamp holders - various stapes ceiling roses - round blocks - socket outlets - plug tops I.C.D.P, I.C.T.P, I.C.T.P.N main switches - distribution boards.

3.3 Fuses : Definition - Calculation of Fuse Rating Fuse Material - various types of Fuses

## **4. Cables - Wire Jointing**

4.1 Cables : types of Cables - VIR, PVC, CTS/T.R.S., Lead Sheathed, weather proof, flexible cables, copper & Aluminium cables - specifications

4.2 Wire-Jointing : Detailed procedure for straight Joint-Married Joint - T. Joint - Pig tail Joint.

## **5. Wiring Systems - House Wiring - Wiring Circuits**

5.1 Wiring Systems : Energy Distribution Systems - Distribution Board System - T. System - Tree System Loop-in-System - Advantages - Disadvantages.

5.2 House Wiring : Selection of wiring - C.T.S. Wiring casing and capping - conduit wiring (concealed and surface) - comparison of different types of wirings.

5.3 Wiring Circuits : Simple Lamp circuits - staircase wiring - Corridor wiring - Master Circuit - Lodge Wiring - Godown wiring - Tube Light Circuit Running Light Circuit.

## **6. Earthing :**

Necessity of Earthing - Methods of Earthing - Pipe Earthing - Plate Earthing

## **7. Wiring Tests - I.E. Rules**

7.1 Wiring Tests : Meggar Tests - Continuity Test - Insulation Test - Polarity Test

7.2 I.E. Rules : I.E. Rules Regarding Internal wiring - Earthing - Power ckt wiring.

## **8. A.C. Motors - Starters**

8.1 A.C. Motors : 1-0 Motors - Split Phase Motors - Capacitor Motors - Universal Motors - Shaded pole Motors - 3-0 Motors - Construction of 3-0 Induction Motors - Working.

8.2 A.C. Starters : Necessity of starter - Construction and working of D.O.L. Starter - Star-Delta Starter.

## **9. Estimation :**

To prepare Estimation for Residential Buildings, offices, Commercial Shops : Estimation of Load Determination of No. of Sub-Circuits - Distribution of Load over sub circuits - Calculation of Rating of Cable - Length of Batten / PVC Pipe - Length of

cable preparation of material schedule along with their cost in standard proforma -  
Labour cost - Illumination Required at various working places.

### **Electrical Wiring Lab**

Practical No. 01

Periods per week : 18

Total Periods : 144

Max. Marks : 40(I) + 30 (E)

#### **Practicals :**

1. Measurement of power of a Appliance / Circuit
2. Determining the Fusing Current of a fuse
3. Calibration of Energy Meter
4. Practice of Joints (Straight, Married, T and pigtail Joints)
5. Testing and charging of cells
6. Practice of CTS and Conduit wiring on
  - i) one lamp controlled by one SPT switch
  - ii) Two lamps controlled by one switch services and parallel
  - iii) Stair case wiring
  - iv) Corridor wiring
  - v) Master Circuit
  - vi) Lodge wiring
  - vii) Godown wiring
  - viii) Tube light wiring
7. Preperation of Different Running light circuits
8. Practice wiring with channels
9. Practice on concealed and surface wiring
10. Measurement of Insulation Resistance of wiring Installation by using meggar
11. Continuity and polarity tests by using Meggar
12. Measurement of Earth Resistance by earth Meggar
13. Installation of pipe and plate Earthing
14. Connecting, starting of running and reversing of a I-Q capacitor motor.
15. Connecting, starting and running of I-Q shaded pole motor
16. Connecting, starting and running of commutator motor
17. Study of D.O.L. & Star/Delta starters
18. Fault location and rectification of D.O.L. & Star/Delta start.
19. Identification of the terminals of 3-Q Induction Motor

20. Connecting, Starting, running and reversing of 3-Q Savirrel cage and slip-ring induction motors.
21. Work out measurements of a building or a shop and prepare the list of items for wiring.
22. Prepare the specifications list of itmes required for working
23. Estimate the cost of Materials required as per market rate
24. Estimate labour charges as per the market schedules.
25. Prepare and estimate for starting a small work shop for submitting to a Bank for loan

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Each Practical 6 periods (approximately)

### Module Subject - II

#### Domestic Appliances - Rewinding

Total Periods : 72

Periods per Week : 06

Max. Marks : 30

Major Topics		
S. No.	Topic	No. of Periods allotted
1.	Heating Appliances	9
2.	Motorise Appliances	9
3.	Other Appliances	9
4.	Winding Shop	9
5.	General procedure for Rewinding	9
6.	I-Q A.C. Motors winding	12
7.	3-Q A.C. Motors winding	15

### Syllabus Contents :

1. **Heating Appliances** : Electric Iron - Electric Stove - Immersion coater Heater Geyser - Table lamp - Testing & Repairing.
2. **Motorised Appliances** : Electric Fans (Ceiling Fan, Table Fan, Pedastal Fan etc.) Electric Mixer - coet Grainders - Coashing Machine - vaccume cleaner - Electric

Hand drill - Domestic water pump sets : Installation, Testing, Servicing and Repairing of above Mentioned Appliances.

### 3. Other Appliances :

Installation, Testing, Servicing and Repairing of Emergency Light - Invertor -

### 4. Winding Shop :

Tools - Instruments, Equipment Required for winding Shop Layout of winding shop - precautions.

### 5. General procedure for Rewinding

Types of windings - Tools Required for Rewinding Armature, Rotor - Taking Data from original winding - No. of turns Types of winding - Gauge of wire - weight of winding wire shape of coils - No. of Layers - winding pitch - connections Method of removing old coils - cleaning & preparation of slots - Methods of preparation of formers and winding Inserting the coils - wedging - Taping of coils Final.

Final connections - Testing - Impregnation and warnishing of winding - preheating and Baking - Fixing Armature / Rotor, Bearings, end plan Final Testing and Running.

#### 6.1-0 A.C. Motor Winding :

1-0 A.C. Motor windings for Domestic Appliances - Types of windings - starting and Running winding placing of coils to obtain phase difference - comparison between starting and Running winding - winding diagram for F.H.P. Motors - winding Details

#### 7.3-0 A.C. Motor Winding :

Types of windings - Full pitch and chorded winding 3-0 winding Developments - placing of cois for obtaining phase difference - Maintenance of 1-0 and 3-0 Motors

## II. Practical :

### \* Domestic Appliances & Rewinding Lab \*

Total Periods

Periods Per Week : 18

Internal Marks : 40

External Marks : 30

#### Practicals :

- |    |   |    |
|----|---|----|
| 1. | Testing of various Domestic Appliances mentioned in the Theory Subject - 2      | 16 |
| 2. | Dismantling of various Domestic Appliances mentioned                            | 16 |
| 3. | Identification of Fault Location and Rectification of each Appliances mentioned | 16 |
| 4. | Assembling of various Domestic Appliances Mentioned                             | 16 |
| 5. | Installation of water Pumpsets  | 16 |

6.	Winding of an A.C. Motor Startor	16
	i) priliminary tests for Locating Faults	
	ii) Recording Data from Burnt Motor	
	iii) Stripping of old winding	
	iv) Cleaning of Slots	
	v) Making former and preparing coils	
	vi) Placing of coils	
	vii) Making coinding connections - varnishing & Baking	
	viii) Assembly, checking and Running	
	ix) Measurement of speed	
7.	Field coil winding for universal Motor	16
8.	Shaded pole Motor winding	16
9.	Winding of split-phase, capacitor Motors	16

**Faculty :**

1. Diploma in Electrical & electronics Engg.
2. Certificate holder in Electrician trade with 3 years experience.

**Scheme of Instruction**

Modules	Theory		On-the-job training		Total	
	Hours	Weightage	Hours	Weightage	Hours	Weightage
Module - I	72	30	216	70	288	100
Module - II	72	30	216	70	288	100
Total	144	60	432	140	576	200

**V. Scheme of instruction per Week**

	Theory	On-the-job Training	Total
Module I / II	6 Hours	18 Hours	24 Hours

- Module - I : Electrical Wiring  
 Module - II : Domestic appliances & Rewinding  
 OJT - I : Electrical Wiring Lab  
 OJT - II : Domestic Appliances Rewinding Lab

## 4. PLUMBING

### 1. Introduction

Plumber has a significant role in water supply and sanitation works in cities and towns. Taps connection for drinking water from main water resources and drainage arrangement has become common things for health point view. Fixing of toilets too is vital.

### 2. Objectives

At the end of the course the trainee shall be

1. able to do plumbing works for any structure
2. able to fix all sorts of taps, fittings, toilet arrangements and drainage works
3. able to know the operation of tools

### 3. Skills to be provided

1. Handling and use of plumbing tools.
2. Handling different water works using plumbing techniques and methods in pipe laying, pipe joining and water meters, etc.
3. Finding water leakage problems and their remedies in pipe lines and repairs.

### 4. Employment Opportunities

#### a. Wage

After completing the course the student can join in any water works department, public health departments, private hospitals and in industries as a plumber to take care of sanitation system.

#### b. Self

Nowdays almost all villages and towns have water works and drainage problems like major cities. The plumber services are more required like fitting taps, pipe connection, drainage pipe connection, erection of wash basins, sinks, urinal flushing arrangements and attending day to day servicing to repair the pipes and leakage. Works on contract basis in cinema halls, hospitals, etc.

### 5. Syllabus (Theory 6 period/week) Practical - 18 period/week) Module - I

Week	Theory	Practical
1.	Familiarization of the trade, types of works to be done plumbing works.	Importance of the trade, safety precautions to be taken while doing
2.	Use of hand tools, names of the tools.	First aid, usage of tools and determine the materials from which they are

		made.
3.	Description of soil waste pipe, vent pipe and its importance, siphon pipe and its importance	Cutting of pipes Fixing of waste pipe with bends, junction, jointing, fixing of vent pipe.
4.	Types of traps and its uses	Fixing of floor taps, nanhi tap in bath and kitchen.
5.	Slow sand filters and mechanical, filters, Impurities in water Pipes.	Simple pipe connections using G.I.
6.	Values used in plumbing system (sluice valve), reflux valve, scour valve, air valve, pressure relief valve.	Laying water pipe connection to the sanitary fittings. Types of valves and fittings.
7.	Free system, grid iron and radial system. Description of C.I. Pipes and fittings.	Laying and jointing of cast iron pipes (lead pouring and lead caulking)
8.	Water main street line in water storage as well as soil pipe and drainage system.	C.I. Socket pipe heavy, duty joining molten lead
9.	PVC description of ISI specifications of pipes.	Practising on cutting and shaping PVC pipes to sizes, use and fixing of PVC Pipes.
10.	Methods applied for lift pump valves and taps used in service connection, air lock in the pipes and its removal.	Installing hand pump, finding out the defects and rectifying the same. Fixing of showers in toilets.
11.	Storage tanks for general water supply purpose. Steel tanks, masonry tanks automatic float switch underground tanks.	Erecting simple water supply system as per layout. Introducing valves where ever necessary and connecting to the storage tanks.
12.	Causes for damage in taps, valves and water meter and tank, etc. methods of rectification and modification.	Reconditioning of taps, valves, flushing tanks. Testing for correct functioning

### **MODULE - II (OJT - II)**

13.	Description of sanitary fitting. General points to be observed when choosing sanitary fittings.	Installing Indian W.C. with high level cistern including fixing flush pipe connection, water connection and connecting the outlet to the drainage line or inspection chamber.
14.	Description of Indian style W.C. and R.W.C. standard sizes, types Precautions to be observed while	Installing western W.C. with low level flushing, cistern with flush pipe connection, fixing of double flap seat,

	installing	connecting the outlet to the drainage line.
15.	Types of urinal, description of flushing, devices, lipper automatic tanks, Principles of siphon ball valves in a flushing system.	Installing a urinal with automatic flushing system connecting the same to the inspection chamber.
16.	Description of wash basin, its standard sizes and accessories required for installing wash basin, sizes of mirror, towel rail, glass shelf, precautions to be observed while installing.	Installing of wash basin with lead waster or PVC waste pipe, connecting of the pillar tap to service connection, soap dish, connect the waste to the gully trap or floor trap.
17.	Description sink types of sink, sizes of kitchen, sink, pantry, laundry sink, sizes of waste outlets.	Installing a sink with drain board, waste outlet connecting the waste outlet with all fittings water service connection to the sink.
18.	Description of bath tub, accessories required for installing a bath tub	Installing a bath tub with hot and cold connection with shower, over flow and connection to the sink.
19.	Importance of introducing the trap of the sanitary fittings. Deep seal traps and low seal traps.	Method of arranging the waste outlets for urinals, flushing arrangements
20.	Conservancy system and water carriage system. Combined system.	Laying and jointing of store ware pipe with help of sight rail and bounding rod, jointing of stone ware pipes.
21.	Standard length of store ware pipes, sizes, self cleaning velocity, sewage system. rod.	Laying and jointing of store ware pipe with the help of sight rail and bonding
22.	Earth work excavation and laying drain pipes. Precautions to be observed.	Fixing of a fully trap and connecting the same to a chamber.
23.	Description of vent pipes its necessity. Traps used in drainage line, man holes, cess pool, soak pits, septic tanks, size of septic tank according to the users.	Providing vent pipe from a starting chamber construction of soak pits, and septic tanks.
24.	Preparation and fixing up hot water supply as per layout.	Fixing up hot water supply. Domestic boilers, geysers, installation of hot water system.
25.	Causes and remedies. Prevention of corrosion.	Cleaning of sanitary fittings leakage and repairs.

## 6. List of equipement/machinery

1. Try square
2. Pipe wrenches
3. Hand drills
4. Mortise chisel
5. Plane jack
6. Cutting pier
7. Tap and sly set
8. Washer cutter
9. Smooth and rough tiles
10. Screw drivers
11. Spanners set
12. Hack saw
13. Spirit level
14. Polythene tube to check levels
15. Travels, etc.

**7. Raw Material Required**

**a. Consumable**

- i. Cement
- ii. White cement
- iii. Jute
- iv. Thread
- v. M-seal
- vi. White lead
- vii. Kerosene

**b. Non-consumable**

- i. Charts
- ii. Models
- iii. Tray, etc.

**8. Reference Books**

Public Health and Engineering by Duggal

## 9. Faculty

1. ITI Certificate holder in the trade with 3 years experience.
2. Diploma in Civil Engg.

## Scheme of Instruction

Modules	Theory		On-the-job training		Total	
	Hours	Weightage	Hours	Weightage	Hours	Weightage
Module - I	72	30	216	70	288	100
Module - II	72	30	216	70	288	100
Total	144	60	432	140	576	200

## V. Scheme of instruction per Week

	Theory	On-the-job Training	Total
Module I / II	6 Hours	18 Hours	24 Hours

- Module - I : Study of tools and equipment  
Module - II : Study of plumbing works  
OJT - I : Tools and equipment Lab  
OJT - II : Accessories installation Lab

## List of Participants

### B. Swarna Latha

Training Officer

I.T.I. Mallapally, Hyderabad.

# 5. WELDING

## 1. Introduction

Welding is a technique of joining two or more metal pieces by the application of heat pressure. It is application of heater pressure. It is a very old art. This is a most rapid and easiest way of fabrication and joining of the metal pieces. Due to its significant role in industries and day to day life it has become an important technology. It is within the reach of a common man also.

Welding is nowadays extensively used in automobile industry, air craft, machine frames, structural work, machine repair work, pipeline fabrication in thermal power plants and also in day to day life welding of bicycle, scooters, grills, window fabrication, etc. Many of the cast products are nowadays being fabricated by welding various parts together. The main advantage of that products are lighter and stronger. Gas cutting is another application of welding process, which plays a significant role in industries.

## 2. Objectives

1. To operate the controls of welding machines.
2. Able to connect welding cables with welding machines and job.
3. Able to use safety equipment to protect eyes, hands and body from ultra violet rays.
4. Able to know safe guard himself from fire hazards.
5. Able to start and stop welding transfer, generator and rectifier.
6. Able to identify the Metal to be welded by scratching or tapping process in the light of welding arc.
7. Able to start welding with uniform beads in flat position without defects and able to stop the process.
8. Able to deposit in the open corner joint with complete penetration
9. Able to deposit covering layer on the root run head and complete the weld
10. Able to do deflect free fill in open corner joint.
11. Able to weld joint in correct alignment with uniform and correct size of head.
12. Able to do welding of butt joint of level edges to form a single "Vee"
13. Able to weld a "Tee" joint with correct weld size in horizontal position.
14. Able to set job in overhead position according to our required height.
15. Able to prevent molten pool and slag while doing welding
16. Able to deposit straight line heads uniformly without defects.
17. Able to detect the defects in heads.
18. Able to become perfect to identify gas leakage before and after welding
19. Able to check up pressure while welding
20. Able to cut the pipe by arc and gas flame
21. Able to identify empty gas cylinders.

22. Able to make the metals free from oil, grease, while doing are welding or gas welding.
23. Able to operate first aid box and to have fundamental idea of medical treatment.
24. Able to follow all safety precautions to protect eyes, body, etc. by using glasses, etc.
25. Able to be familiar with safety recommendations for installation of are or gas welding equipment and cutting equipment.
26. Able to follow general instruction regarding explosion, fire and other hazards and good ventilation.

### **3. Skills to be provided**

After completing the course the welder trainee shoul be able to

1. Identify the different types of metals which can be welded.
2. Identify tools and their maintenance.
3. Identify machinery like welding transfer, generator, electrodes, and their maintenance.
4. Identify electrodes sizes and their use.
5. Have knowledge of correct voltage.
6. Identify correct thickness and size of weld and use of helmet, goggles, hand gloves, etc.
7. Identify welding techniques positions and joints.
8. Identify welding defects like blow-holes, uneven heads, due to uneven voltage and imperfect work.
9. Gain working knowledge in handling gas cylinders, regulators, etc.
10. Gain knowledge in handling are welding process and gas welding process.

### **4. Employment Opportunities**

After successful training in welding technology, the welder will be able to work on wages and the welder can also start his own workshop under self employment basis.

#### **Self employment :**

A student who has undergone this course can start his own workshop and easily can maintain on profit by attending fabrication works and repairing works like fabrication of grills, doors, windows, frames, iron steps, in building construction repairing works, like joining broken bicycle rods, scooters and other four wheelers repairing works, fabricating iron chairs, tables, frames, etc.

#### **Wage Employment :**

The welder can also join as a Part time welder in different industries like BHEL, HAL and so on. He can work in any small scale industry where such fabrication works are taken. He can also work as a contractor in Government fabrication works or he may work under any such contractor.

## 5. Syllabus

### MODULE - I

12 x 6 = 72

1. Safety precautions, operation of first aid.
2. Welding tools and equipment in arc and gas welding and maintenance.
3. Use of A.C. and D.C. welding machines.
4. Common gases used in welding like Oxy-acetylene flames temperature and their uses.
5. nomenclature of welding joints and welding symbols.
6. Welding position, flat, horizontal, vertical, over head, slope and rotation.
7. Principles of arc welding its characteristics.
8. Arc length its effect, polarity, types, identification of wrong polarity.
9. Types of electrodes, objects of flux coating, characteristics of flame coding and specification of filter rod.
10. Regulators types, connection maintenance, type of blow pipe usage.
11. Blow holes in welding structure and its effects and remedies.
12. Faults welding and their remedies

### MODULE - II

12 X 6 = 72

13. Welding techniques, LHS and RHS
14. Distortion in arc welding - defects in arc welding - remedies
15. Development elbow joint, tee joint
16. Welding inspection tasks
17. Welding on non-ferrous metals like brass, aluminium, copper, etc.
18. Resistance welding
19. TIG welding and MIG welding
20. CO<sub>2</sub> welding process
21. Submerged arc welding
22. Electro slag welding
23. Types of cutting processes.
24. Revision

### OJT - I

12x18 = 216

1. Introduction and importance of trade safety - precautions and safety equipments.
2. By D/H/P are welding open corner joint
3. Filter lap joint by D/H/P by arc welding
4. Straight line head horizontal positions by arc welding

5. Single "V" butt joint Horizontal position by arc.
6. Straight line head Vertical position by arc.
7. Fillet lap joint V/P by arc welding
8. Outside corner joint V/P by arc welding
9. Straight line head O/H/P cover head position by arc welding
10. Square butt joint OHP by arc welding
11. Safety precautions to gas welding equipment flames and their uses fusion run without / with tiller rod.
12. Square butt joint D/H/P (Down hand position) by gas welding
13. Fillet Tee joint D/H/P by gas
14. Straight line method H/P by gas
15. Open corner joint H/P by gas
16. Straight line head V/P by gas

**OJT - II**

**16 x 18 = 216**

17. Fillet "Tee joint" V/P by gas
18. Straight line head O/H/P by gas
19. Filled lap joint O/H/P by gas
20. Pipe butt joint revolving position by gas
21. Pipe "Tee" joint by gas
22. Flange joint (Revolving position by electrical arc
23. Pipe elbow joint by electrical arc
24. Arc cutting / metal thickness increasing by arc
25. Gas cutting by gas
26. Brazing on non ferrous metals by gas
27. Welding of non ferrous metal like brass, copper, aluminium, cast iron by gas.
28. TIG fusion run with and without filler rod D/H/P by gas welding
29. TIG lap joint D/H/P by gas
30. CO<sub>2</sub> welding straight line bead D/H/P by electrical arc.
31. Job estimation related material cost and time.
32. Production of jobs as per drawing

33. General idea to start self employment regarding, erection of shop, getting loans, from state/central Government/financial corporation / banks.

**6. List of equipment / machinery**

Serial	Equipment/Machinery	No./set Per Student
1.	Gloves	1
2.	Apron leather	1
3.	Hand welding screen	1
4.	Helmet type welding screen	1
5.	Goggles	1
6.	Center pinch 9 x 127 mm	1
7.	Chisel cord flat 19 mm	1
8.	Wire brush 15 x 3.7 cm	1
9.	Spark lighter	1
10.	Chipping screen	1
11.	Safety gools for welding	1
12.	Safety white goggles grinder	1
13.	Scribert	1
14.	Tong 30 cm	1
15.	Hammer ball pein 1 kg with handle	1
16.	Screw driver 25 cm	1
17.	Leg vice 150 mm	1
18.	Number punch letter punch	1
19.	Hack saw frame adjustable	1
20.	Flat file 35 cm rough	1
21.	Half round file 30 cm	1
22.	Spanner set contains 12 no.	1
23.	Clamps for each machine	1
24.	Hammer sledge 3 kg	1
25.	Steel tape 5 m each	1
26.	Gas welding torch with Nozles	1
27.	Electrode holder 400 ampr.	1
28.	Welding rubber hose pipe for oxygen 9 acetylene	1
29.	Spindle key for opening cylinders	1
30.	Pressure regulator for oxygen and acetylene cylinders	1

- |     |                |   |
|-----|----------------|---|
| 31. | Tip cleaner    | 1 |
| 32. | Colour goggles | 1 |

### **Machinery equipment's for welders**

1. A. C. Transformers 300 Amps - 400 Amps - 2 sets - All accessories.
2. D. C. generator 200 Amps - 300 Amps - 1 set - with all accessories
3. CO2 welding machine complete 400 Amps - 1 set.
4. T. I. G. welding set 300 amps AC/DC - 1 set
5. Welding cables to carry 350 amps with flexible rubber 45 m
6. Oxygen cutting machine - 1 set
7. Gas welding table
8. Arc welding Unit
9. Trolley and bucket of water
10. Power hack saw machine

### **7. Reference Books**

1. Welding technology Khanna publications by R. I. Agarwal
2. Welding technology by Gupta Kaushish
3. A text book of welding technology by Dr. O.P. Khanna
4. Theory and practice of arc welding by Fred J Jafrey
5. Welder's guide by F.D. Graham
6. Arc and acetylene welding by H. Kerwin.

### **8. List of participants**

V. Ellaiah  
Asst. Professor  
J. B. Engineering College  
Hyderabad.

1. Diploma in Mechanical Engg.
2. Certificate holder (ITI) with 3 years experience.

**Scheme of Instruction**

Modules	Theory		On-the-job training		Total	
	Hours	Weightage	Hours	Weightage	Hours	Weightage
Module - I	72	30	216	70	288	100
Module - II	72	30	216	70	288	100
Total	144	60	432	140	576	200

**V. Scheme of instruction per Week**

	Theory	On-the-job Training	Total
Module I / II	6 Hours	18 Hours	24 Hours

- Module - I : Welding equipment Theory  
 Module - II : Welding Procedure

## 6. CARPENTRY

### 1. Introduction

Carpentry and joinery are common terms used with any class of work with wood. Strictly speaking carpentry deals with all works of carpentry such as roof, floors, partitions, of a building while joinery deals with the making of doors, windows, cupboards, dressers, stairs and interior fittings for a building. Carpentry involves cutting, shaping and fastening wood and other material to produce, furniture, building roofs, doors, windows. In villages it is an important trade to prepare ploughs, bullock carts and other such agriculture equipment.

### 2. Objective

1. To know different wood working tools
2. To know techniques in wood working to become a good craftsman
3. Able to know to prepare T-Joint for best accuracy
4. Able to know mortise, tenon joint or corner joints
5. Able to prepare small articles like, rack, stool and chair
6. Able to apply polishing and varnish
7. Able to estimate to required wood

### 3. Skills to be provided

After the completion of the course the trainee should be able to

1. Select wood like seasoning wood
2. Know the function of tools and their maintenance
3. Know carpentry joints, and manufacturing of such joints usage.
4. Know carpentry process planing, chiseling, sawing, etc.
5. Know working machines and their operations
6. Estimate wood material required for a particular job
7. Calculate carpentry calculations
8. Recognize the importance of different woods like teak, devadar, etc. and use them for required purpose.
9. Do independently the required wood working

### 4. Employment Opportunities

#### Wage

1. Building constructions for preparation of doors, windows
2. Can join in any furniture shop in regular basis or daily basis to make chairs, tables, stools, racks, etc.
3. He can work in any timber depots.

4. He can work in any hospital or cinema hall for maintenance and repairing work
5. He can join any plywood works for making doors etc.
6. He can work in film studios for making carpentry work

### **Self**

1. He can start a furniture making shop
2. He can start independently making doors, windows, etc.
3. Can start plywood and glass frames shops
4. can start wood turning shop
5. He can start hardware shops related to wood work
6. He can start a shop for fabrication and repairing of agriculture works like ploughs, bullock carts.,etc.

## **5. Syllabus**

### **Module - I**

**(72 - Period)**

1. Structure of wood
2. Seasoning of wood
3. Classification of wood
4. Common varieties of Indian timber
5. Carpentry tools
  - i. Marking and measuring tools
  - ii. Cutting tools
  - iii. Planing tools
  - iv. Boring tools
  - v. Striking tools
  - vi. Holding and miscellaneous tools
6. Carpentry Process
  - a. Marking
  - b. Sawing
  - c. Planing
  - d. Chiseling
  - e. Boring
  - f. Grooving
  - g. Rebating

h. Moulding

**MODULE - II**

**(36 periods)**

**7. Carpentry Joints**

- a. Halving Joints
- b. Mortise Joint
- c. Tenon Joints
- d. Bridle Joint
- e. Corner Joint
- f. Dowel Joint
- g. Tongue and Groove joint
- h. Screw and Slot joint
- i. Dovetail Joint

**8. Wood working machines**

- a. Wood working lathe
- b. Circular saw
- c. Band saw
- d. Scroll saw

**OTJ- I -**

**216**

- 1. Cutting saw practice
- 2. Introduction of safety rules
- 3. Identification of timber
- 4. Identification of tools for different operation
- 5. Planing practice
- 6. Grinding and chamfering
- 7. Chiseling practice
- 8. Use of different chisels
- 9. Practice in making
  - i. Halving Joint
  - ii. Mortise and tenon joints
  - iii. Bridle joint
- 10. Setting and sharpening of different types of saws
- 11. Single and common dovetail joints
- 12. Bridle joint

**OJT for the Module - II**

**216**

- 13. tongue and groove joint

14. Small articles office tray fabrication
15. Familiarity with wood machines
16. Operation of circular saw
17. Operation of planing mic
18. Operation of drilling and grinding mic
19. Making beading
20. Fabrication of stool, wall stands, small rack, small tables, boxes
21. Furniture polishing and varnishing
22. Fabrication of door frames and shutters and repairing
23. Estimation

## **6. List of Equipment / Machinery**

### **A. Machines**

1. Planning machine
2. Circular saw machine
3. Band saw machine
4. Wood turning machine
5. Beading making machine

### **B. Tools**

1. Planes
2. Saws
3. Chisels
4. Drilling tools
5. Supporting tools
6. Measuring and marking tools
7. Boring tools

### **C Raw Materials**

1. Wood
  2. Plywood
  3. Novapon
  4. Decolam
  5. Gluep
6. Hardware items like nails, screws, bolts, etc.

## 7. Reference Books

1. "Basic shop theory carpentry" by R.C. Gupta - Dhanpathi Rao & Sons
2. "Production technology" by M. Lal - Dhanpathi Rao & Sons

## 8. List of Participants

1. B. Sathyanarayan  
D. T. O. Carpentry  
I. T. I. Mallepally
2. V. Ellaiah  
Asst. Professor,  
JBIET, Hyderabad
3. G. V. Eswara Reddy  
Lecturer  
Govt. Polytechnic, Masab Tank,  
Hyderabad.

## Faculty (Teaching and for Practical work)

1. Diploma in Mechanical Engg.
2. ITI Carpentry (Main trade) with 3 years experience

## Scheme of Instruction

Modules	Theory		On-the-job training		Total	
	Hours	Weightage	Hours	Weightage	Hours	Weightage
Module - I	72	30	216	70	288	100
Module - II	72	30	216	70	288	100
Total	144	60	432	140	576	200

## V. Scheme of instruction per Week

	Theory	On-the-job Training	Total
Module I / II	6 Hours	18 Hours	24 Hours

- Module - I (Theory 3) : Study of tools and Machines  
Module - II (Theory II) : Operating Procedure  
OJT - I (Theory II) : Use of tools and Machines  
OJT - II : Fabrication Lab.

## **III - COMPUTER SCIENCE**

1. Computer Applications
2. Information Technology
3. Data Entry
4. Multimedia, Graphics & Animation
5. Hardware Technology.

# 1. COMPUTER APPLICATIONS

## **Introduction :**

With the introduction of Advanced Supplementary Examinations and consequent abolition of Supplementary Examinations at SSC and Intermediate levels, unsuccessful candidates - running in to a few lakhs in number - have to lose one precious academic year. It has become a historical responsibility for the education department to channel these students into worthwhile activity, and short term certificate courses are introduced with this motive to train in some skill so that they can take-up small service oriented occupations to earn their livelihood. These courses are open to youth, unemployed with pure academic background and house-wives as well.

Since a decade, computers have made lasting impression on human civilization. We have come to a stage wherein we cannot imagine living without computers. They are extensively used in every walk of life such as households, offices, business, post offices, banks, bus & train reservations, insurance companies, hospitals, educational institutions, processing of results.

Use of computers makes a number of tasks easier and faster. Computers are helpful in improving productivity and efficiency either at the office or at home. One need not be computer wizard to use computer. A little zeal to excel and a little will power to learn new things are sufficient to become a computer literate.

The course of Computer Applications is aimed at developing skills in using MS Office for general purpose computer actively and skills in programming through C and C++, Further, the experience is consolidated and reinforced by way of Project work by applying the skills in developing a simple application.

## **Objectives :**

- i. To develop professional competence in the use of computers.
- ii. To generate self and wage employment
- iii. To make aware of existing needs / changing needs / emerging needs of the society.

## **Skills to be provided :**

- i. Skills in handling various operating systems.
- ii. Skills in programming and system maintenance
- iii. Data processing skills

## **Employment opportunities :**

- Wage :
1. Programmers in software companies
  2. Processing In-charges
  3. Sales assistant in E-market

- Self :
1. Information service centres
  2. Establishing DTP centres
  3. Software development centres

### Scheme of Instruction

Modules	Theory		On-the-job training		Total	
	Hours	Weightage	Hours	Weightage	Hours	Weightage
Module - I	72	30	216	70	288	100
Module - II	72	30	216	70	288	100
Total	144	60	432	140	576	200

### V. Scheme of instruction per Week

	Theory	On-the-job Training	Total
Module I / II	6 Hours	18 Hours	24 Hours

Paper I : Operating Systems & MS - Office

Paper II : Programming Languages & Project work

### Syllabus : Module - I - O.S. & M.S. Office

No	Subject	Contents
1.	Introduction	Introduction, Characteristics of Computers, History of Computers, Generations of Computers, Classification of Computers, Computer Applications, Architecture of Computers, Computer Architecture and I/O Devices, Basic Structure of a Computer, Random Access Memory (RAM), Flow of Information, Memory Size, Input/Output Units, Description of Computer input Device, Key to floppy data entry System, Floppy Disk input unit, Magnetic Hard Disk, Floppy Disk Drive. (3 Theory) familiarising various components & connections (6 hrs OJT)
2.	DOS	DOS, What is OS, Getting Started With Dos, and Important Terms. (3 Theory files file entendants system files, subordinates.(9 hrs. OJT)
3.	Windows	To Start a Program, To Start a Ms-Dos Windows, To shutdown your Computer, To find a file or folder, To copy a file or folder To more a file or folder, To delete a file or folder, To create a Folder, To Change the name of a file or folder, To print a document, Browsing using Internet Explorer, To move an icon, Switching applications, To permanently display the taskbar. (2 Theory 9 hours OJT)
4.	Ms-Office	<b>Microsoft Word</b> : To create a new file, To create a new Document,

		operators, inline functions and memory management, operator constant and static member functions, pointer to members, overloading concepts, overloading operators, overloading functions, type conversions, more class features, special pointer 'this', function changing, static class data members, static class member functions, abstract classes, virtual base class, class inheritance. Polymorphism in c++, stream output/input, file input/output function templates, class templates, exception handling (24 Theory, 48 hrs. OJT)
8.	Project	Live project in any reputed organization (24 hrs. OJT)

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**Reference Books :**

1. Let us "C" - (Yashwant P. Kanetkar)
2. Fundamentals of MS-Office (BPB)
3. Introduction to Computers with MS Office - Alexis Leon,
4. Unix - (Yashwant P. Kanetkar)

## 2. INFORMATION TECHNOLOGY

### Introduction :

With the introduction of Advanced Supplementary Examinations and consequent abolition of Supplementary Examinations at SSC and Intermediate levels, unsuccessful candidates - running in to a few lakhs in number - have to lose one precious academic year. It has become a historical responsibility for the education department to channel these students into worthwhile activity, and short term certificate courses are introduced with this motive to train in some skill so that they can take-up small service oriented occupations to earn their livelihood. These courses are open to youth, unemployed with pure academic background and house-wives as well.

Since a decade, computers have made lasting impression on human civilization. We have come to a stage wherein we cannot imagine living without computers. They are extensively used in every walk of life such as households, offices, business, post offices, banks, bus & train reservations, insurance companies, hospitals, educational institutions, processing of results.

Use of computers makes a number of tasks easier and faster. Computers are helpful in improving productivity and efficiency either at the office or at home. One need not be computer wizard to use computer. A little zeal to excel and a little will power to learn new things are sufficient to become a computer literate.

In the modern world, information is power. Acquiring information, storing, updating, processing, sharing, distributing etc. are the essentials of Information Technology. With the great speed of accessing, storing, reproducing, and processing computers have become a tool-incomparable. Computers have out-smarted all other equipment used for handling "Information". This certificate course on Information Technology aims at equipping the students with the basics of computer usage through MS-Office, then on internet concepts for effective use of internet, handle and manage websites, and develop a web based application.

### Objectives :

- i. To develop professional competence in the use of computers.
- ii. To generate self and wage employment
- iii. To make aware of existing needs / changing needs / emerging needs of the society.

### Skills to be provided :

- i. Skills in handling various operating systems.
- ii. Skills in programming and system maintenance
- iii. Data Processing skills.

### Employment opportunities :

Wage : 1. Web designers in software companies

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2. Processing In-charges

3. Sales Assistant in E-market

- Self :
1. Information Service Centres
  2. Establishing DTP centres
  3. Web development centres

Duration : 6 months

### Scheme of Instruction

Modules	Theory		On-the-job training		Total	
	Hours	Weightage	Hours	Weightage	Hours	Weightage
Module - I	72	30	216	70	288	100
Module - II	72	30	216	70	288	100
Total	144	60	432	140	576	200

### V. Scheme of instruction per Week

	Theory	On-the-job Training	Total
Module I / II	6 Hours	18 Hours	24 Hours

Module - : MS-Office

Module - II : Web Designing & Project

### Syllabus : Module - I : MS-Office & Internet

No	Subject	Contents
1.	Introduction	Introduction, Characteristics of Computers, History of Computers, Generations of Computers, Classification of Computers, Computer Applications, Architecture of Computers, Computer Architecture and I/O Devices, Basic Structure of a Computers, Random Access Memory (RAM), Flow of Information, Memory Size, Input/ Out Units, Description of Computer input Device, key to floppy data entry system, Floppy Disk input unit, Magnetic Hard Disk, Floppy Disk Drive (Theory 3, familiarising various compenents & Connections (6 hrs. OJT)
2.	DOS	DOS, What is OS, Getting Started With DOS, and Important Terms. (Theory 3, file enteraims system files, utilities files, Directories, & Sub directories. (9 hrs. OJT)
3.	Windows	To Start a Program, To Start a MS-Dos Windows, to shutdown your Computer, To find a file or folder, To copy a file or folder to move a file or folder, To delete a file or folder, To create a folder, To Change the name of a file or folder, to print a document, browsing using Internet Explorer, To move an icon, Switching applications, To permanently display the taskbar. (Theory 2, 9 hrs. OJT)

4.	Ms-Office	<p><b>Microsoft Word :</b> To create a new file, To create a new Document, to open a Created Document, Saving a document, To find a word in a Document, To correct spelling and grammar, to change the page margins, To count Words &amp; Lines in a Document, To add a command or other item to a menu, Adding page numbers, Header and Footers, Mail-Merge, Using a header Souce for mail merge, Styles, Paragraph Spacing, Adding Borders, To keep Paragraph together, Set tabs stops with header Characters, Comment Mark Macro, Pictures, Create Hyperlink, create Bookmark, Add a Bookmark, Sort,Formula, Insert Table, Protect Document, Background, Printing. (Theory 16, 48 hrs. OJT)</p>
		<p><b>Power Point :</b> Auto contet Wizard, Design Templates, To make a new Slide, Move, Copy or Duplicate a slide, To Change the layout Adding text, Adding text by using text Book Tool, To insert and edit Picture, Add a clip from clip gallery, Windows Media Folder, Clip Gallery Live Add Transitions to a slide show, Printing. (Theory 8 hrs. 24 hrs. OJT)</p>
		<p><b>MS-Excel :</b> Introduction to spreadsheet, Excel as Spreadsheet, To create a new work book, To open a workbook automatically when you start excel, About workbook and worksheet, Move and scroll through a worksheet, Switch to another sheet in a workbook, select a sheet in a workbook, Manipulating data in cells, Printing, Functions. To apply an autoforamt to a range, To apply an existing style, To create a new style, To hide a workbook, to create a scenario, To create links to connect to data and files, To create a hyperlink from cell text, To create a pivot Table, what is pivot Table, Filter, Auditing, Hide Windows Documents, Excel Graphs (Theory 16, OJT 48 hrs.)</p>
		<p><b>MS-Access :</b> Database concepts, Creating tables, Inserting data into table, updating data, linking tables, Querries generation (different types), Designing forms, Inserting data into tables using forms, creating sub forms, creating reports based on tables &amp; based on querries, security features of MS-Access, Database utilities. (20 Theory, 60 hrs. OJT)</p> <p><b>MS-Office :</b> (4 Theory, 12 hrs. OJT)</p>
5.	Internet Concept & Networking	<p>Introduction, what is Internet ? How does Internet Works, Domain Name System, How can I connect to Internet, Host Terminal Connections, Individual Computer TCP/IP Link, the Limitations of a SLIP or PPP account, Dialup or On demand TCP/IP Link through LAN, dedicated Link Connection, Tools and Services on Internet, Electronic Mail on Internet, E-Mail auto response, Usenet and New groups, What is FAQ? Browsing the Internet, What is Gopher ?, What is World Wide Web (WWW).</p> <p><b>Internet Tools :</b> Introduction, Electronic Mail, what about privacy, E-mail addressing, The components of e-mail, Message Composition, FTP and Telnet, How to use FTP, Microsoft Internet Explorer, Building your Web Page, Creating a secure Website,</p>

Implementing Fire Walls, Forms of attack, Requirement of secure fire Wall, Methods of restricting Access, IP Address, Domain Name System, TCP/IP Configuration. (12 Theory, 36 hrs. OJT)

**Paper II : Web Designing & Period Work**

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6.	Web Designing	Introduction of Internet, Internet & Intranet Protocols : TCP/IP, HTTP, FTP, POP, The WWW, URLs, Setting up of Colours, Setting up of Background What is Web Designing ? Web Servers, Personal Web Server, Internet Information Server Including Shockwavefiles, HTML, Basic Formatting tags, Lists, Links & Images, Tables Frames, Forms, Meta Tags, Mapping. DHTML: Single Page, Cascading Style Sheets, Style Tag, Java Script, VB Script, Front Page Visual Interdev, Dream Weaver, Multimedia concepts, Hardware requirements, Software requirements, Gif Animator Photoshop, Flash. (60 Theory,
7.	Project	Live project in any reputed organization. (156 hrs. OJT)

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**Reference Books :**

1. Let us "C" - Yashwant Kanitkar
2. Fundamentals of Ms-Office (BPB)
3. Flash Bible - BPB
4. Complete Reference to HTML
5. Fundamentals of Computers (BPB)

### 3. DATA ENTRY

#### **Introduction :**

With the introduction of Advanced Supplementary Examinations and consequent abolition of Supplementary Examinations at SSC and Intermediate levels, unsuccessful candidates - running in to a few lakhs in number - have to lose one precious academic year. It has become a historical responsibility for the education department to channel these students into worthwhile activity, and short term certificate courses are introduced with this motive to train in some skill so that they can take-up small service oriented occupations to earn their livelihood. These courses are open to youth, unemployed with pure academic background and house-wives as well.

Since a decade, computers have made lasting impression on human civilization. We have come to a stage wherein we cannot imagine living without computers. They are extensively used in every walk of life such as households, offices, business, post offices, banks, bus & train reservations, insurance companies, hospitals, educational institutions, processing of results.

Use of computers makes a number of tasks easier and faster. Computers are helpful in improving productivity and efficiency either at the office or at home. One need not be computer wizard to use computer. A little zeal to excel and a little will power to learn new things are sufficient to become a computer literate.

The course on Data Entry is designed to equip the students with skills in using the computers on application software and DTP. Desk-Top-Publishing otherwise known as DTP has brought revolutionary changes in the publishing and design industry. It has given ordinary users the power to produce professional quality documents, enables a single person to perform all the tasks of design layout, typesetting, placements of graphics and printing the document. DTP software produce complex, multicolor, printer ready documents reducing the dependency and involvement of many people. Skilled persons in data entry have good employment opportunities in the offices, newspaper and printing industry. Youth and women can take up data entry as job work in their leisure hours.

#### **Objectives :**

- i. To generate data processing experts
- ii. To generate self and wage employment.
- iii. To make aware of existing needs/changing needs / emerging needs of the society.

#### **Skills to be provided :**

- i. Skills in handling various Operating systems
- ii. Skills in system maintenance and data processing maintenance
- iii. Processing and output designing

#### **Employment opportunities :**

Wage : 1. Data processing assistants in software companies

2. Data processing In-Charge
3. Sales assistant in E-market

- Self :
1. Information service centres
  2. Establishing Data entry firms
  3. Establishing DTP centres

### Scheme of Instruction

Modules	Theory		On-the-job training		Total	
	Hours	Weightage	Hours	Weightage	Hours	Weightage
Module - I	72	30	216	70	288	100
Module - II	72	30	216	70	288	100
Total	144	60	432	140	576	200

### V. Scheme of instruction per Week

	Theory	On-the-job Training	Total
Module I / II	6 Hours	18 Hours	24 Hours

Duration : 6 months

Module - I : MS-Office

Module - II : DTP Graphics

### Syllabus :

Module - I : MS-Office

No	Subject	Contents
1.	Introduction	Introduction, Characteristics of Computers, History of Computers, Generation of Computers, Classification of Computers, Computer Applications, Architecture of Computers, Computer Architecture and I/O Devices, Basic Structure of Computers, Random Access Memory (RAM), Flow Of Information, Memory Size, Input/Output Units, Description of Computer input Device, Key to floppy data entry System, Floppy Disk input unit, Magnetic Hard Disk, Floppy Disk Drive, familiarising various components and connections (3 Theory, 6 hrs. OJT)
2.	DOS	DOS, What is OS, Getting Started With DOS, and Important Terms. System & file commands. Directories, sub directories (3 Theory, 6 Practicals, 9 hrs OJT)

3. Windows To Start a Program, To Start Windows, To shutdown your Computer, To find a file or folder, To copy a file or folder To move a file or folder, To delete a file or folder, To create a Folder, To Change the name of a file or folder, To print a document, browsing using Internet Explorer, To move an icon, Switching applications, To permanently display the taskbar & other features (2 Theory, 9 hrs OJT)

4. M.S. Office To create a new file, To create a new Document To open a Created Document, Saving a document, To find word in your Document, To correct spelling and grammar, to change the page margins, to count Words & Lines in a Document, To add a command or other item to a menu, Adding page numbers, Header and Footers, Mail-Merge, Using a header Source for a mail merge, Styles, Paragraph Spacing, Adding Borders, to keep Paragraph together, Set tabs stops with header Characters, Comment Mark Macro, Pictures, Create Hyperlink. Create Bookmark, Add a Bookmark, sort, Formula, Insert Table, Protect Document, Background, Printing. (16 Theory, 48 hrs. OJT)

**Power Point** : Auto content Wizard, Design Templates, To make a new Slide, Move Copy or Duplicate slide. To Change the layout, Adding text, Adding text by using text Box Tool, To insert and edit Picture, Add a clip from clip gallery, Windows Media Folder Clip Gallery Live, Add Transitions to a slide show, Printing. (8 Theory, 24 hrs. OJT)

**Ms-Excel** : Introduction to spreadsheet, Excel as Spreadsheet, To create a new work book, To open a workbook automatically when you start excel, About workbook and worksheet, Move and scroll through a worksheet, Switch to another sheet in a workbook, select sheet in a workbook, Manipulating data in cells, Printing, Functions, To apply an autoformat to a range. To apply an existing style, To create a new style, To hide a workbook To create a scenario, To create links to connect to data and files, to create a hyperlink from cell text, To create a pivot Table, what is pivot Table, Filter, Auditing, Hide Windows Documents, Excel Graphs. (16 Theory 48 hrs. OJT)

**MS-Access** : Database concepts, Creating tables, Inserting data into table, updating data, linking tables, Queries generation (different types), Designing forms, Inserting data into tables using forms, creating sub forms, creating reports based on tables & based on queries, security features of MS-Access, Database utilities. (20 Theory 60 hrs.OJT)

**MS-Front Page** (4 Theory, 12 hrs.OJT)

**Module- II : DTP & Graphics**

5. Page Maker : Introduction to Page Maker, adjustment of paper settings, create layout, Explanation about tool box, Selection of paper size, create inputs and index table of contents. Utilities : add, continue line, balance columns, create key line, bullets and numbering, Group ungroup, lock, unlock, run script, create page numbers, create color library, Spell check, links, links info. Format : auto leading set width, alignment create custom font, and create custom colour, Elements : create round corners, image control, control palette, color palette, table-Editor. (24 Theory, 72 hrs. OJT)
6. Corel Draw Introduction to Corel draw, features of Corel draw, tool box, text format, fit text to path, blend effects, envelope rollup, presents, create symbols, create arrows, create colours, node edit, background settings, wire frames, import file, special preferences. (24 Theory, 48 hrs. OJT)
7. Photoshop Painting & editing : opening a file, working with palettes, using the layers palette, Using the painting editing tools, smudging a selection, saving palettes. Selections : Tool overview, selecting with the marquee tool, moving a selection selecting with the magic wand tool, selecting with the lasso tool, saving & loading selections, transforming a selection, adding a text, cropping the image. Promotional piece : creating and viewing layers, rearranging layers, changing the mode of a layer, feathering a selection, defining and filling with a pattern, linking layers, adding a layer effect to a type layer, flattening and saving files. Using Paths : Drawing paths with pen tool, storing a path, drawing curved paths, filling a path, combining straight and curved lines, making a path into a Selection, drawing a path around an artwork, transforming a path channels and masks : working with masks & channels, using channels, and creating a quick mask. Editing a quick mask, saving a selection as a mask, loading a mask as a selection, and using the replace color command, creating a gradient mask, applying filters to mask. Advanced layer Techniques: Working with layer masks, creating a clipping group. Adding adjustment layers, adjusting hue & saturation, removing layer masks, save layered files. Understanding color; Making colour corrections, using the Variations command, adjusting color adjusting color with the level command, adjusting color with the curves command, making selective color corrections, lightening, darkening & saturating areas. (24 Theory, 72 hrs. OJT)
8. Project : Project on the above software (24 hrs. OJT)

#### Reference Books :

1. Fundamentals of Ms-office (BPB)
2. Page Maker - BPB
3. Corel draw - BPB
4. Photo Shop Savvy - (BPB)

# MULTIMEDIA, GRAPHIC AND ANIMATION

## Introduction :

With the introduction of Advanced Supplementary Examinations and consequent abolition of Supplementary Examinations at SSC and Intermediate levels, unsuccessful candidates - running in to a few lakhs in number - have to lose one precious academic year. It has become a historical responsibility for the education department to channel these students into worthwhile activity, and short term certificate courses are introduced with this motive to train in some skill so that they can take-up small service oriented occupations to earn their livelihood. These courses are open to youth, unemployed with pure academic background and house-wives as well.

Since a decade, computers have made lasting impression on human civilization. We have come to a stage wherein we cannot imagine living without computers. They are extensively used in every walk of life such as households, offices, business, post offices, banks, bus & train reservations, insurance companies, hospitals, educational institutions, processing of results.

Use of computers makes a number of tasks easier and faster. Computers are helpful in improving productivity and efficiency either at the office or at home. One need not be computer wizard to use computer. A little zeal to excel and a little will power to learn new things are sufficient to become a computer literate.

In the business world, advertisement and publicity plays an important part in marketing their respective products. In the service oriented sector including educational institutions and hospitals, huge amounts are spent in developing catchy advertisements. Computers have revolutionized this field also through their versatility. Textual matter with scenes and sound is multimedia and graphics and animation breath life in the publicity campaigns. There are opportunities in the job market for skilled and talented people who are proficient in Multimedia, Graphics and Animation.

## Objectives :

- i. To generate web designers
- ii. To generate self and wage employment

## Skills to be provided :

- i. Skills in generating graphics and animation

## Employment Opportunities :

- Wage :
1. Web designers in software companies, Animators Developers in Film Industries
  2. Sales assistant in E-market
  3. Web developers
- Self :
1. Web designing centers Animation Pictures development centre.
  2. Website maintaining service Photography mixing Centres.

## Scheme of Instruction

Modules	Theory		On-the-job training		Total	
	Hours	Weightage	Hours	Weightage	Hours	Weightage
Module - I	72	30	216	70	288	100
Module - II	72	30	216	70	288	100
Total	144	60	432	140	576	200

### V. Scheme of instruction per Week

	Theory	On-the-job Training	Total
Module I / II	6 Hours	18 Hours	24 Hours

Duration : 6 months

Module - I : Multimedia

Module - II : Graphics & Animation

### Paper I : Multimedia

#### Syllabus :

No.	Subject	Contents
1.	Introduction	Introduction, Characteristic of Computers, History of Computers, Generation of Computers, Classification of Computers, Computer Applications, Architecture of Computers, Computer Architecture and I/O Devices, Basic Structure of Computers, Random Access Memory (RAM), Flow Of Information, Memory Size, Input/Output Units, Description of Computer input Device, Key to floppy data entry System, Floppy Disk input unit, Magnetic Hard Disk, Floppy Disk Drive. familiarising Components & Connections (3 Theory, 6 hrs. OJT)
2.	DOS	DOS, What is OS, Getting started With Dos, and Important Terms. System & file commands, Directories & Sub-Directories (3 Theory, 9 hrs. OJT)
3.	Windows	To Start a Program, To start a Ms-Windows, To shutdown your Computer, To find a file or folder, To copy a file or folder To move a file or folder, To delete a file or folder, To create a Folder, To Change the name of a file or folder, To print a document, Browsing using Internet Explorer, To move an icon, Switching applications, To permanently display the taskbar & other features (2 Theory, 9 hrs. OJT)
4.	Internet-concepts	Introduction, what is Internet? How does Internet Works, Domain Name System, How can I connect to Internet, Host Terminal Connections, Individual computer TCP/IP Link, the Limitatations of a SLIP or PPP account, Dialup or On-demand TCP/IP Link through

LAN, dedicated Link Connection, Tools and Service on Internet, Electronic Mail on Internet, E-Mail auto response, Usenet and Newsgroups, FAQ ?, Browsing the Internet, Gopher, World Wide Web (WWW).

**Internet Tools** : Introduction, Electronic Mail, what about privacy, E-mail addressing, The components of e-mail, Message Composition, FTP and Telnet, How to use FTP, Microsoft Internet Explorer, Building your Web Page, Creating a secure Website, Implementing Fire Walls, Forms of attack, Requirement of Secure fire Wall, Methods of restricting Access, IP Address, Domain Name System, TCP/IP Configuration.

(16 Theory, 48 hrs. OJT)

5. Corel Draw Introduction to Corel draw, features of Corel draw, tool box, text format, fit text to path, blend effects, envelop rollup, create symbols, create arrows, create colours, node edit, background settings, wire frame, import file, special preferences.

(24 Theory, 72 hrs. OJT)

6. Photoshop Painting & editing : opening a file, working with pallets, using the layers palette, Using the painting editing tools, smudging a selection, saving palettes. Selections : Tool overview, selecting with the marquee tool, moving a selection selecting with the magic wand tool, selecting with the lasso tool, saving & loading selections, transforming a selection, adding a text, cropping the image. Promotional piece : creating and viewing layers, rearranging layers, changing the mode of a layer, feathering a selection, defining and filling with a pattern, linking layers, adding a layer effect to a type layer, flattening and saving files. Using Paths : Drawing paths with pen tool, storing a path, drawing curved paths, filling a path, combining straight and curved lines, making a path into a Selection, drawing a path around an artwork, transforming a path channels and masks : working with masks & channels, using channels, and creating a quick mask. Editing a quick mask, saving a selection as a mask, loading a mask as a selection, and using the replace color command, creating a gradient mask, applying filters to mask. Advanced layer Techniques: Working with layer masks, creating a clipping group. Adding adjustment layers, adjusting hue & saturation, removing layer masks, save layered files. Understanding color; Making colour corrections, using the Variations command, adjusting color adjusting color with the level command, adjusting color with the curves command, making selective color corrections, lightening, darkening & saturating areas.

(24 Theory, 72 hrs. OJT)

### **Module - II : Graphics & Animation**

7. Adobe illustrator Basic concepts, Drawing, painting, transformations using type, using graphs, printing documents. (12 Theory, 24 hrs. OJT)

8. 3d Max 2-D & 3-D graphics, important terminology, standards, graphics devices, rendering, shadows and textures, colour theory for illustrations, business logos and artworks.

(30 Theory, 84 hrs. OJT)

- |     |         |  |                         |
|-----|---------|--|-------------------------|
| 9.  | Flash 5 | Toolbar, colors, framework, menus, pallettes, settings and preferences drawing, animation, symbols and instances, sound, actions event handling, programming flash with action script, working with 3D graphics. | (30 Theory,84 hrs. OJT) |
| 10. | Project | Project work in the above software   | (24 hrs. OJT)           |

**Reference Books :**

1. Teach yourself Windows (BPB) - Stevens
2. Internet - The complete Reference
3. Corel Draw
4. Photoshop 7 Savvy (BPB)

## 5. HARDWARE TECHNOLOGY

### Introduction :

With the introduction of Advanced Supplementary Examinations and consequent abolition of Supplementary Examinations at SSC and Intermediate levels, unsuccessful candidates - running in to a few lakhs in number - have to lose one precious academic year. It has become a historical responsibility for the education department to channel these students into worthwhile activity, and short term certificate courses are introduced with this motive to train in some skill so that they can take-up small service oriented occupations to earn their livelihood. These courses are open to youth, unemployed with pure academic background and house-wives as well.

Since a decade, computers have made lasting impression on human civilization. We have come to a stage wherein we cannot imagine living without computers. They are extensively used in every walk of life such as households, offices, business, post offices, banks, bus & train reservations, insurance companies, hospitals, educational institutions, processing of results.

Use of computers makes a number of tasks easier and faster. Computers are helpful in improving productivity and efficiency either at the office or at home. One need not be computer wizard to use computer. A little zeal to excel and a little will power to learn new things are sufficient to become a computer literate.

Now that computers are very widely used, and most of the younger generation being software bound there is growing need for hardware maintenance personnel. This course is meant for developing skills in system assembling, maintenance and repair. All necessary basics in electricity, electronics, and circuitry have been incorporated in the course to give the students a comprehensive knowledge and develop working skills in hardware technology.

### Objectives :

- i. To generate hardware experts
- ii. To generate self and wage employment

### Skills to be provided :

- i. Skills in handling various operating systems.
- ii. Skills in system maintenance and hardware maintenance
- iii. System upgradation

### Employment Opportunities :

- Wage :
1. Hardware assistants in software companies
  2. System In-charge
  3. Sales assistant E-market.

## Scheme of Instruction

Modules	Theory		On-the-job training		Total	
	Hours	Weightage	Hours	Weightage	Hours	Weightage
Module - I	72	30	216	70	288	100
Module - II	72	30	216	70	288	100
Total	144	60	432	140	576	200

## Scheme of instruction per Week

	Theory	On-the-job Training	Total
Module I / II	6 Hours	18 Hours	24 Hours

**Module - I : Electricity, Electronics & OS. - 3 Months**

**Module - II : Computer Hardware & Networking - 3 Months**

**Syllabus :**

**Module - I : Electricity, Electronics & OS.**

**Theory :**

**Introduction :** Electric Current, DC & AC voltages & graphic representations. Concept of current, potential difference, voltage and resistance, Ohm's law, resistances in series and parallel, Kirchoff's laws - application to simple DC circuits, power and energy concepts (6 Hours)

Electronics : Capacitors : Functions and types, series and parallel connection of capacitors, electric field, energy stored in capacitors, charging and discharging of capacitors (4 hours)

Electromagnetism : Magneto - motive force, flux, reluctance and permeability, energy stored in magnetic fields, Faraday's laws of Electromagnetic Induction, Lenz's law, self and mutual induction, B-H curve, Eddy currents and their significance, inductance I series and parallel. (4 Hours)

Alternating Current : Concept of Alternating voltage and current, difference between AC&DC, concept of frequency, period cycle, amplitude hase, Transformer principle, construction and working of transformer, application. (6 Hours)

Semiconductor Devices : P type materials, P-N junctions, Diode, forward and reverse biasing, characteristics and application of Zener diode, LED, PNP and NPN transistor - transistor biasing, transistor as a switch. (4 hours).

**OJT :**

Drawing of electrical and electronics symbols as per specifications, familiarization with various electric material, tools, and meters, identification of components and devices, study of resistors and colour coding, measurement of voltage and circuit using voltmeter Ameter & Multimeter, capacitors and testing with multimeter, verification of Ohm's law and Kirchoff's law, resistors in series and parallel circuits, testing of transformer, continuity, insulating

and voltage ratio, Soldering and de-soldering involving tag, PCB terminations, ICs, testing semiconductor diode, LED and Zener with multimeter. (72 Hours)

### **Theory :**

Integrated circuits : Linear and digital ICs, TTL and CMOS ICs - Characteristics, parameters, timer circuits. (4 hours)

Amplifiers : transistor as amplifiers, CC, CB, CE modes of operation, operational amplifiers, OP-AMP inverting and non-inverting modes of operation. (6 Hours)

**Power Supply :** Diode rectifier, half wave, full wave, bridge, filter circuits, stabilized power supplies, series regulators, Ni-Cd, lead acid batteries, short circuit and over voltage protection, typical supply circuits using ICs, SMPS, Principles and applications of CVT, invertors and UPS. (4 hours)

Digital Electronics : Binary, decimal, octal and hexadecimal number systems and their conversions, Binary addition and subtraction. Logic Gates : AND, OR, NOT, NOR, XOR, XNOR gates, their logic diagrams and truth tables, positive and negative logic, half, full binary adders, Boolean Algebra, DeMorgan's theorems. Flip Flops RS, JK, JK Master slave flip flops, Counters, Registers, and Memories (10 Hours)

### **OJT :**

Measurement of voltage and frequency with C.R.O. Study of Half wave, Full wave rectifiers, Full wave rectifiers using filters, fabrication of stabilized power supply using series regulator ICs (7805, 7812), CE amplifier, study of Phase shift and Colpitts oscillators, Verification of truth tables of basic gates circuit, building basic gates using NAND, NOR gates, Truth tables of Half and Full adders, Study of inverting and non-inverting amplifiers using OP-AMP, fabrication of delay switching circuit using IC 555, fabrication of 7 segment display with decoder counter, study of R-S and J-K Flip-Flops. (72Hours)

### **Theory :**

Micro processor : Block diagram, architecture of 8085 micro processor with peripheral chips such as 8255, 8251, 8279, USART, Clock generators. Getting familiar with PC and various parts. (10 Hours)

Operating System : OS Concepts, batch processing, time sharing, real time, multi tasking, multi-programming; computer networks, distributed processing (3 hours)

**Ms-DOS :** DOS, Internal and external commands, system files, batch files, backup and restore process, directories and sub-directories, loading device drivers for CD-ROM and other peripherals (4 hours)

**Ms-Windows :** Startup and shutdown procedures, control panel, add/remove hardware, device manager, network, modem, sound, dialup networking, printers, administrations, drive mapping, net works, file and print sharing on the network (7 Hours)

### **OJT**

Study of 8085 Micro processor kit, micro processor peripheral chips and their application, simple programmes such as addition and subtraction based on 8085 kit, familiarization with computer hardware, Installing DOS, configuration and fine tuning of DOS using MEM, MEMMAKER and MSD, practicing internal, external and file commands of DOS, creating and using various drivers in AUTOEXEC.BAT and CONFIG.SYS files, Installing Windows, detailed study of control panel and various settings (72 Hours).

## **Module - II : Computer Hardware & Networking.**

### **(Module : IV)**

**Theory :** Computer hardware and internal structure

**Motherboard :** Motherboard various designs, various buses, single board computers, AT, Mini AT, ATX, configuration of various socket formats, expansion buses (ISA, EISA, PCI, PCMCIA) ( 3 Hours)

**Processor :** Study and specification of CPU's available in the market, installation of CPU in related motherboards, operating voltage, power management, upgradation, functional parts of microprocessor (3 Hours)

**Processor :** Study and specification of CPUs available in the market, installation of CPU in related motherboards, operating voltage, power management, upgradation, functional parts of microprocessor (3 hours)

**Memory :** Various volatile and non-volatile memory, concept of FPM, EDO, SDRAM, SIMM, DIMM, Installation of various RAM into motherboard, Static Memory, ROM, PROM, EPROM, EEPROM, Internal, External and Cache Memory (3 Hours).

**BIOS :** Power-on self test, error codes, beep codes, BIOS extensions, BIOS capability, BIOS development, BIOS identifications, system configuration and CMOS setup. (3 Hours)

**Hard Disks :** Hard disk technology, rotation, speed, data transfer rates, media, R/W heads, clusters, FAT, formatting, partitioning, installation of hard disks, various types of hard disks (IDE, EIDE, SCSI). (3 hours)

**Floppy disk & Floppy disk drive :** Drive components, R/W heads, head activator, motor, circuit board, connectors, floppy disk controller, types of floppy disk drives (1.2 MB, 1.44 MB), Installation of floppy disk drive, trouble shooting, R/W head aligning and cleaning, repairing of floppy disk drive. (3 Hours).

**Display adopter and montors :** Applications of VGA adopters & display, VESA, SVGA, standard, video RAM video processor, AGP, 3D accelerators, troubleshooting, types of monitors, resolution, mono & colour VGA/SVGA monitors, interlaced & non-interlaced monitors, precautions to be taken while handling monitors. (3 Hours)

### **OJT :**

Familiarisation of various parts of comuter, installation and removal of CPU, Test voltages and frequencies, jumper settings on the motherboard with reference to manual, installation of memory in related sockets, installation of PCI card and configuration of driver software, configuration of CMOS BIOS setup, power and data connections to system board and various peripherals, study of various types of motherboards, partitioning, formatting of hard disks and loading of DOS and Windows, installing floppy disk drives, aligning and cleaning of R/W head, Assembling of computer, fabrication of serial cable. (72 Hours)

### **Theory : Computer hardware**

**SMPS & Cabinet :** Power supply, Power supply ratings, functions and operation of power supply, colour coding, types of connectors (P8 - P13), testing voltages, power greed signal, power supply problems, troubleshooting of SMPS, repairing power supply, various types of cabinets - vertical tower, mini tower. (5 hours)

**I/O devices :** Types of key boards, keyboard technology, keyboard trouble shooting and repair, keyboard-mouse interface, types of mouse, installation of mouse, mouse interface type (serial, PS/2 mouse port, cleaning of mouse, troubleshooting). (4 hours)

**CD ROM & DVD Drives** : Principles, operation, characteristics, data transfer rates, access time and types of CD ROM/DVD (IDE and SCSI), CD ROM disks, drive formats, installation and troubleshooting, disk formats, types, installation and troubleshooting of sound card and multi-media speakers. (4 hours)

**Serial and Parallel Interfaces** : Types of connectors - D types, 9 pin, 25 pin, 5 pin, male, female, their connections and configurations, RS 232 C and Centronics / IEEE 488 protocols. (2 hours)

**Printers** : Printer types, principles, working, parameters of impact and non-impact printers, speed, formats, 9 pin and 24 pin printers, parts of printers, overhaul of printers, types of bubble jet and ink jet printers, thermal and piezo inkjet printer, identification of various parts of inkjet printer, overhauling and servicing, replacement and refilling of cartridges, principle, specification and operation of laser printer, replacement of toner cartridge, installation and troubleshooting of laser printer, principle and working of line and high seed printers. (6 hours)

**Modem** : Principle, operation, types and applications of modern, parameters, installation and troubleshooting of modem, terminal emulation software. (3 Hours)

#### **OJT :**

Study of circuit diagram of switch mode power supply, replacement of fan, P8-P13 connector in SMPS, adjustment of D indicator of cabinet with jumpers, dismantling, assembling and cleaning keyboard, fabrication of various data cables with related connectors, installation of CD-ROM, DVD-ROM drives in DOS and Windows operating system, installation of sound card, installation and configuration of DMP or inkjet or laser printer, replacement of Printer head, replacement and refilling of cartridge, overhauling and servicing, installation, configuration and fine tuning of MODEM. (72 hours)

### **Computer Networking**

#### **Theory :**

**Network basics** : Models of network computing - centralised computing, distributed computing, collaborative computing, Network models : client/server, peer to peer, LAN, MAN and WAN, Introduction to Archir, Ethernet, FDDI, ATM (2 Hours)

**OSI Model** : Standards, ISO, OSI refeence model, communication by peer layers, concept of physical layer, datalink layer network layer, transport layer, session layer, presentation layer, application layer. (3 Hours)

**Transmission Media** : Transmission frequencies, characteristics of transmission media, cable media, coaxial cable, twisted pair cable, fibre optic cable, wireless media, radio, microwave integrated, public and private networks, internet connecting hardware for various types of cables. (3 hours)

**Network Topologies** : Connection types, physical topologies based on point to point connections - Ring, Star, Hybrid topologies. (2 hours)

**Data Transmission** : Digital to Analogue Signalling, Digital Signalling Technique, Analogue Signalling, Bit Synchronisation, Asynchronous Communcation, Synchronous Communication, Baseband and Broadband Transmission, Multiplexing, Frequency Division

Multiplexing, Time Division Multiplexing. (3 Hours)

**Protocol Suits** : Models and Protocols, Introduction to Netware IPX, TCP/IP, IEEE 802 family, IP, ICMP, RIP, OSPF, TCP, UDP, ARP, DNS, FTP, SMTP, TELNET, NFS, SLIP, PPP. (4 Hours)

**Network Architecture** : Ethernet specifications, ethernet board settings, Ethernet cabling, Ethernet frame types, Ethernet troubleshooting. (3 Hours)

**Network Connectivity** : Network devices, NICs, Hubs, Repeaters, Bridges, Multiplexers, Modems, Inter-Network connectivity, Routers, Brouters, Gateways. (4 hours)

**OJT** :

**Identification of Network Components** : Passive - Cables - UTP, Thin Ethernet, Thick Ethernet, Fibre Optic Cable. Connectors : BNC Connector, Terminator, RJ-45 Connector, Male / Female, Info Outlets, Jack Panels, Active-Hub, Switch, Installation of Ethernet card on a PC with IRQ settings and Base I/O address-setup using software or Jumpers, changing ports from UTP to BNC to AVI port in a combo card, Crimping of BNC connectors on thin Ethernet cable, Crimping of RJ-45 connector using 568A and 568B specification on UTP cable, establish connectivity between two PCs on Peer to Peer Network by mapping drive & sharing, Connecting a printer and sharing it between two PCs. Configuring modem on a PC for Internet access, Installation of Windows NT or NetWare Server, Connectivity between Windows PC and NetWare/Windows NT Server by logon. (72 Hours)

**Reference Books :**

1. Computer Hardware - Govindarajulu

**List of Syllabus Committee Members for Computer Science Courses :**

1. Dr. V. Surender  
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Mahaboobnagar (Dist.)

# **IV - HOME SCIENCE**

## **TWO MODULE COURSE**

- 1. Bakery and Confectionary**

# BAKERY AND CONFECTIONARY

## Introduction

Bakery products comprise biscuits, cookies, bread buns and similar products. All age groups enjoy these products Bakery products represent low cost, nutritious convenience foods compared to many other Indian sweets, desserts, ice cream and other traditional confectionery products.

Bakery is not only a skill but an art. Bakery production is a skill oriented enterprise, which has become very popular among all the age groups. Besides being fast moving bakery products also have good shelf life compared to other sweet meat products. Baking is erroneously considered as a different form of cooking which is difficult to master, on the contrary this art can be easily acquired and mastered even by less educated and unprivileged. The skill can be advantageously utilised for income generation apart from adding to the variety at domestic and commercial level. Hence there is scope in promoting this skill as an opening in for entrepreneurship. Thus a need is felt by Government & Non-Government organisation to impart intensive training in baking to the less privileged illiterates, or educated unemployed or school dropouts, or to those already in bakery trade, who can in turn extend the training to others or further master this knowledge to gain fully utilize the skill learnt as a self enterprise for income generation.

## Specific Objectives of the Course

- To impart skill to the technical input required for a bakery enterprise.
- To help the students to seek vocation in the area of training.
- To channelise the training toward establishing self enterprise for income generation

## Skills to be Provided

- The skills of selecting, handling, and use of equipment
- The skill of selecting the raw material - quality testing and use.
- The skill of preparation, technical do's and do'nts
- Identical faults and making necessary remedies to get a good product.
- Skills of costing and fixing the selling price.

## Job Opportunities

### Wage Employment

- Can be employed as bakers in large and small scale bakery units.
- Can be taken as on contract bakers.
- Employment in canteen, catateria, fast food centres.
- As trainers for untrained perosnal.

## Self Employment

- Can start a bakery enterprise
- Can cater to the orders.
- Can start a training centre.

## Scheme of Instruction

Modules	Theory		On-the-job training		Total	
	Hours	Weightage	Hours	Weightage	Hours	Weightage
Module - I	72	30	216	70	288	100
Module - II	72	30	216	70	288	100
Total	144	60	432	140	576	200

## V. Scheme of instruction per Week

	Theory	On-the-job Training	Total
Module I / II	6 Hours	18 Hours	24 Hours

## MODULE - II

### Bakery 30%

1. Introduction - Definition of the term Bakery and Confectionary Bakery industry in India - Its prospect and future. 4 hrs.
2. Common cereals used for baked product - Wheat types and milling. 5 hrs.
3. Raw material used in the preparation of baked products. Role uses quality and quantity. Classification - essential and optional Ingredients. 10 hrs.
4. Bakery equipment in brief. Different types of oven - Their use care & maintenance. Accessary Equipment. 5 hrs.
5. Cakes - different types, methods, faults correction remedies. 10 hrs.
6. Biscuit making and other flour & sugar confectionery items. 10 hrs.
7. Cake decoration - different types of uses. 10 hrs.
8. Glossary of Bakery term. 3 hrs.
9. Food Cost calculation-Raw material, mark up cost, Profit fixing of selling price. 10 hrs.
10. General failure in baking - reasons and remedies. 5 hrs.

**72 hrs.**

## On the Job Training

1. (Preparation of cakes, biscuits, cookies, jam and other confectionary item - flour and sugar confectionary). 20 hrs. The technical skill in selecting the raw material and preparation of the product. Do and Don't in the preparation. Quality evaluates of the end product. 20 hrs.

## Module - II

**Bakery** 30%

1. Introduction to yeast fermented products. Bread and bread industry in India and South India. Its prospects and future. 6 hrs.
  2. **Bread Preparation** : Importance of choosing the right Ingredients quality and quantity. Essential and optional ingredients. Role of each ingredient. Bread - Method of mixing, baking, time and temperature. 10 hrs.
  3. Common bread faults and remedies or corrections. 6 hrs.
  4. Different methods of bread making. Technique required in preparation. Do's and Don't. 10 hrs.
  5. Other yeast fermented products - Buns, dinner rolls, pizza, burger etc. preparation method and fault correction. 10 hrs.
  6. Bread fault correction. 10 hrs.
  7. Spoilage of yeast fermented products. Raw material used to improve the quality and shelf life of the product. 10 hrs.
  8. Types of ovens used in bread industry - their use of care. 10 hrs.
- 72 hrs.

## On the Job Training

1. Preparation of bread by different methods. 50 hrs.
  2. Quality testing of the raw material used in bread making. 50 hrs.
  3. Quality evaluation of the end product. 50 hrs.
  4. Preparation of other yeast fermented products - pizzas, dinner rolls, Buns, Burger etc., 66 hrs.
- 
- 216 hrs.
- 

## List of Training Centres for Practicals

- Food craft institute - Advance training centre Vidyanagar,
- Modern Foods Uppal

- Asoka Biscuits and foods Amberpet.
- Small of medium bakeries in twin cities.

## **List of Equipment / Machinery Required**

### **Nonconsumable /Consumable**

#### **a. Bakery and Roasting equipment**

Baking trays  
 Baking tin large & small  
 Baking mould  
 Cake tins  
 Flan rings  
 Griddle  
 Pie dishes.  
 Souffle mould  
 Swiss roll tray  
 Tartlet moulds

#### **b. Bowls and Jugs**

Jugs (Steel, Plastic or enamel)  
 Mixing bowls (different sizes)

#### **c. Cutting tools**

Ball scoop  
 Kitchen scissors  
 Bread knife  
 Palattee knife  
 Chief's knife  
 Pastry and biscuits cutters (plain & fluted)  
 Pastry wheel  
 Peelers  
 scraps  
 Rubber Scoops  
 Bread dough cutter  
 Pizza cutter  
 Pastry cutter.

#### **d. Grinder and Graters**

Grater (Stainless Steel)  
 Mixer and Chopper  
 Grinder, blender

**e. Hollow ware (pots and pans)**

Deep tryer  
Double sauce pan  
Frying pans  
Milk pans  
Sauce pans  
Enamel bowls  
Mixing bowls

**f. Moulds**

Charlotte mould  
Jelly mould  
Pie mould  
Ring moulds  
Cake moulds

**g. Openers**

Tin Openers  
Cork screw opener  
Bottle opener

**h. Spoons**

Wooden spoons  
Perferated draining spoons  
Rubber Spatula  
Patette knief

**i. Weighting and Measuring equipment**

Thermometer  
Kitchen timer optional  
Measuring cup  
Measuring jug  
Measuring spoons  
Weighing scales

**j. Containers**

Bread bins  
Flour bins  
Plastic storage container's  
Storage jars and tins

**k. Cooling equipment**

Cooling Trays  
Cooling racks.  
Cooking grills.

**l. General equipment**

Cake decorating equipment  
Chopping boards  
Rolling pins  
Flour sifter  
Pastry brush  
Funnel  
Lemon squeezer  
Turn table

**m. Cleaning Utensils**

Bottle brush  
Mops and brushes  
Dusters.

**n. Stationery**

Alluminium foil  
Paper cups  
Grease proof paper (Butter paper)

**Mechanical equipment**

Machine or equipment which work on power other than manual

eg.

Baking oven  
Handmixer  
Multimixer  
Blender  
Planetary mixer  
Egg beater

### **List of Supplier in Hyderabad / Secunderabad**

1. Lakshmi Crockery  
Abids Road,  
Hyderabad - 500 001.
2. Apsara Crockery  
Opp. Chermas, M.G. Road,  
Secunderabad.
3. Veerani Enterprises  
Orient estage, Abids Road,  
Hyderabad - 500 001.
4. Asiatic Crockery  
M.G. Road., Secunderabad.

### **9. Qualification for Taching Staff :**

1. B.Sc. with Bakery as one of the Subject
2. Cattering technology
3. Diploma in Bakery & confectionery

### **List of Reference Books**

1. Cake making by Edmund B. Bennion James Stewart G.S.T. Bamfard.
2. Biscuit manufacture - Fundamental of in live production Peter R. Whiteley.
3. Biscuits crackers and cookies Volume I Technology Production and Management - W.H. Smith
4. Basic Baking by Dubony
5. Upto date bread making W.S. Farus
6. Upto date bread making A.R. Daniel
7. Bakery materials and methods A.R. Daniel
8. The Bakers Dictionery A.R. Daniel.

## List of Participants

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