

1	Name of Syllabus	<b>Certificate Course in Mobile Repairing and Servicing. (301104)</b>												
2	Max.Nos of Student	25 Students												
3	Duration	6 month												
4	Type	Part Time												
5	Nos Of Days / Week	6 Days												
6	Nos Of Hours /Days	4 hrs.												
7	Space Required	1) Workshop = 200 sqfeet 2) Class Room = 200 sqfeet TOTAL = 400 sq feet												
8	Entry Qualification	S.S. C Appeared												
9	Objective Of Syllabus/ introduction	To prepare a student to – (1) Explain operations of Mobile system. (2) Installation and Up gradation of Mobile systems. (3) Preventive maintenance of Mobile (4) Care Level Fault diagnosis in Mobile This course will enable students to do installation, preventive maintenance of mobile												
10	Employment Opportunity	Self Employment												
11	Teacher’s Qualification	For Lecturer :- Diploma in Electronics & Telecommunication /Industrial Electronics /Digital Electronics For Instructor :- Diploma in Electronics & Telecommunication /Industrial Electronics /Digital Electronics												
12	Training System	<b>Training System Per Week</b> <table><tr><td>Theory</td><td>Practical</td><td>Total</td></tr><tr><td>6 hrs</td><td>18hrs</td><td>24hrs</td></tr></table>							Theory	Practical	Total	6 hrs	18hrs	24hrs
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13	Exam. System	Sr. No.	Paper Code	Name of Subject	TH/PR	Hours	Max. Marks	Mini. Marks						
		1	30110411	Fundamental of Electronics & Mobile phone Technology	TH-1	3 Hrs	100	35						
		2	30110412	Mobile Maintenance & Repair	TH-2	3 Hrs	100	35						
		3	30110421	Fundamental of Electronics & Mobile phone Technology	PR-1	3 Hrs	100	50						
		4	30110422	Mobile Maintenance & Repair	PR-2	3 Hrs	100	50						
				TOTAL			400	170						

## **SYLLABUS**

### **Theory – I Fundamental of Electronics & Mobile phone Technology**

#### Introduction to Electronics

1. Types of materials viz. Insulator, conductor, semiconductor Common Insulators, Conductors (Copper, Silver, and Gold) Semiconductors (Germanium, Silicon).
2. AC & DC signals Everyday Use of Current, Application, Difference and advantages of each Generation of AC, DC currents, Sources of Power, Battery, power. OHMS Law, calculation Examples.
3. Resistor, capacitor, inductor, transformers, transistors, (8 hrs) Color coding, capacity of resistors, Type of Resistors. Capacitor Types paper electrolytic. Inductor types, Working, PNP, NPN types. Amplifiers, Transformers, step up, step down. AC to DC converter, Power adapters.
4. Introduction to binary system Counting, Hex system, bits, byte megabyte, giga byte. Why Binary counting, Storage of data. Advantages of binary.
5. Introduction to integrated Circuits  
Scheme Diagrams  
Circuit diagrams  
Circuit diagrams  
Gates, and, or, NOT, NOR.  
Basic circuits and examples  
LSI, VLSI  
Typical IC codes & Uses of Ics.  
LED's, LCD display.
6. Types of Memories  
Transistor, Capacitor memories.  
Switching property.  
Dynamic memory, Static memory.  
Difference, use of the memory, types  
DRAM, SRAM, VRAM, cache memory.  
Primary memory, secondary memory.  
Speed and capacity used.  
Introduction to Hard disk, Floppy Disk,  
Tape storage, PEN Drives, Memory sticks  
CD-ROM, CD-Writers, DVD, Flash Cards, Smart card.  
Applications of these memories.
7. Introduction to CPUs/ processors  
Data Bus, Address BUS, 8 bits CPU  
Basic working of CPU CHIP  
Example of 8085, 8088 or 8051.  
Intro and development path Future CPUS.  
286, 386, 486, Pentium processers.  
AMD, celeron, - comparison on processing capability.  
Speed and application in PC world.
8. Soldering Essentials and Equipments
  - (a) Solder Material.
  - (b) Solder Iron
  - (c) Solder Leads
  - (d) Solder paste
  - (e) De-soldering pump

- (f) De-soldering wire
- (g) Hot air gun
- 9. Test and Measuring Equipments      Multi Mate analog, tester, Digital Multi Mate- Use to measure Current, Voltage, Resistance. How to check Home Voltages, grounding, phase, neutral, earthing. Oscilloscopes, waveform testing. Frequency measurement. Sine wave, square wave, Triangle Waveform.

### **Mobile Phone Technology**

1. Introduction to Signal transmission.  
Modulation, demodulation  
Modem Working  
Amplitude modulation, frequency modulation.  
Carrier frequency.  
Amplification, Filters,  
Allocated Frequency Range for Radio, telephone  
Mobile TV signals.  
Modem Types, speed of transmission.  
Various cards, PCMCIA, Inbuilt cards.
2. Introduction to Operating system, Application software  
Specialized software for testing.  
Hardware and software,  
Operating Windows
  - (a) Computer Desktop setting and configurations.
  - (b) Memories and memory mapping.
  - (c) Peripherals and I/O devices.
3. Internet Browsing Email usage, searching information on the Internet.  
Downloading Info, Files Software and drivers.
4. Basic Tele phone unit. How does a telephone works  
Handset, cordless telephone, range  
EPBAX, use and operation.  
Walkie-Talkie -range and use.  
Pagers, one-way and 2 ways
5. Introduction to landline and Mobile Phones -4.6 chap.  
Cells of network, Antennas, Grid of Cells.  
Orange, BPL, Airtel etc. - operators.
6. Introduction to Landline and mobile Phones.  
Difference bet. Landline and Mobile.  
Range of operation of Mobile.  
Local, STD, ISD calling.  
Cables, fiber optic cables, network of Mobile Connectivity.
7. Introduction to Mobile Phone Batteries and charges  
Li-On Battery, Difference, charging time,  
Life of battery, How to maintain battery charges,
8. Introduction to Mobile phone and its menu setting  
Various menus, settings, options, functions.  
Operating various phones. Nokia, Samsung, LG, Motorola.
  - (a) Mobile Phone Circuit
  - (b) Different Mobile Models - 3310, 6310, Nokia
  - (c) Future of mobiles Phones

- ✓ WAP
  - ✓ GPRS
  - ✓ Blue Tooth
  - ✓ PDA, palm tops, Hand held PCs with phone.
  - ✓ ALL in ones, Computer - phone, Internet, organizer.
9. Different wires/interfaces. How to use hands-free kit and car charger  
Internet cables, GPRS, WLL, and Software for Internet.  
Connecting it to Laptop or PC's.
  10. SIM Card, storage capacity.  
Address, telephone No. Storage.
  11. What are BGA and SMD Ics?
  12. Introduction to CDMA technology.  
Reliance WLL, Comparison with GSM.
  13. Soldering Practice, How to replace BGA and SMD components?

### **PRACTICAL I - Fundamental of Electronics & Mobile phone Technology**

1. Identification of different electronics & Mobile component
2. measurements of A.C. & D.C. Voltage ,Current & Resistance by multimeter
3. Study of different types of memories
4. Assemble & Test AND,OR,NOT,NAND & NOR Logic Gates
5. Assemble & Test All Logic Gates using NOR & NAND
6. Assemble 7 segment LED Display
7. Fault Finding in Hard Disc, Floppy Disc & Different Memory
8. Study the different CPU Chips like 8085,8088, 8051
9. study soldering Techniques
10. measurement of frequency voltage & current using CRO
11. Study of block diagram of CRO & Wave Form Testing
12. Study of peripheral & Input Output devices
13. Study to mobile phone & its various menu setting
14. Study of CDMA & GSM Technology

### **Theory – II Mobile Maintenance & Repair**

- (1) Cell Phone functions and Components Study of Service Software for Cell phone.
  - (a) Logo Manger.
  - (b) Flash Programming.
  - (c) Unlock SP Lock and upgrade software version of a handset.
  - (d) What is IMEI / Phone Lock, SIM Lock
- (2) Troubleshooting
  - (a) Disassembly of Cell Phone
  - (b) Handset Circuit Analysis and Troubleshooting.
  - (c) Discussion of major circuits on the PCB
  - (d) Common fault symptoms analysis Repair flow.
  - (e) Repair tips
  - (f) Demonstration
  - (g) Troubleshooting on hardware problems.
- (3) Case Studies of common handsets like Nokia, Samsung, LG, and Motorola. And other phone companies like Alcatel, Eriksson.
  - (a) Phone is totally dead.
  - (b) Flash Programming doesn't work.

- (c) Power doesn't say on, or phone is jammed.
- (d) Display information: Contact Service.
- (e) Audio failure.
- (f) Charger Failure.
- (g) Receiver Faults.
- (h) Transmitter Faults.
- (4) General Business setup
- (5) "How to start your own Service center of Mobile Repair".  
 Business basics, Time & Money Investment.  
 Setting up a shop, requirements.  
 Making your business.  
 Additional revenue sources (sales, Service)  
 Post paid, pre paid accounts.  
 How to charge for services?  
 Where to buy components?  
 Soft skills for Business communication.

## **PRACTICAL II - Mobile Maintenance & Repair**

1. Study Operation & setting of Cell Phone
2. Identification of various component of mobile hand sets
3. Testing of mobile battery & battery charger
4. Fault Finding & Replacement of new parts without soldering
5. Servicing of mobile
6. soldering & Disorders of various SMD Component , BGA IC,s
7. Checking of track continuity & use of jumpers for track problems
8. Test & Rectify problems in Antenna
9. Trouble shooting in hand set circuit
10. study of lock & unlock of various functions
11. Identification for different faults & testing of deeply interface circuit
12. Identification of faults in network section & voice section & rectify them
13. Rectify the faults related to sim & sim connector
14. Rectify the faults in camera & camera interface circuits
15. Identify & Rectify the faults in blue tooth circuits
16. Common faults symptoms on PCB.
17. Case study of common hand set like Nokia,Samsung,LG,Motorola

## **REFERENCE BOOKS.**

1. Mobile Communication - Mzda.
2. Mobile Communication - C.Y. Lee.
3. Mobile Phone - By Agashe.
4. Mobile Phone - By Lotia.
5. Digital Electronics - pub- McGraw hill.

## **Tools & Equipments**

1. SMD NET WORK STATION ---- 10 NOS
2. Soldering station 6v / 10 watt ---- 10 Nos
3. Magnifying lence with illumination -- 5 nos
4. BGA Soldering kit ----- 10 Nos
5. Computer with flashing unit ----- 5 Nos
6. Tweezers assorted size & sets ----- 10 Nos
7. Digital Multimeter ----- 4 Nos
8. Antistatic pad - As Reqd.

9. Software compatible with different types of hand sets - As Reqd.
10. Screw Drivers Assorted Size & Shapes (Trox) for cell phone
11. Every trainee should have his own tool kits (set of screw drivers, blades, soldering Iron, Multimeter, Set of pliers, cutting nose, combination pliers)

#### LIST OF TOOLS

Personal Computer 1 No.  
Logic probe 1 no.  
Mobile Handsets 3-4 types.  
De-Soldering Pump 1 No.  
Oscilloscope 1 No.  
Digital multi meter 1 no  
Software for Mobiles (Required)  
Training Kits (as required)  
Telephone handset 1 No.  
Cordless Phone 1 No.  
Screw driver set 1 no.