

Syllabus For Jr. Mobile and Smartphone Repair Assistant

Course Name	Jr. Mobile and Smartphone Repair Assistant
Sector	ELECTRONICS & HARDWARE
Course Code	ELE/2023/MSRA/180
Level	3
Occupation	Jr. Mobile and Smartphone Repair Assistant diagnose hardware and software issues in smartphones, providing technical support to customers. Assist in disassembling and reassembling devices, replacing faulty components, and conducting basic repairs. Also ensure proper documentation of repairs and maintain an organized inventory of parts.
Job Description	Jr. Mobile and Smartphone Repairing Assistant provides after sales service to the Mobile and Smartphones users. The technician interacts with the customer and diagnoses the problem to assess the possible causes of malfunction. Once the problem and causes have been identified the technician rectifies minor problems or replaces faulty modules for failed parts or recommends factory repair for major faults.
Course Duration	Total Duration 420 Hrs (T-90, P-210, OJT-60 and ES-60)
Trainees' Entry Qualification	Grade 10 OR Grade 8 with two years of (NTC/ NAC) after 8 th OR Grade 8 pass and pursuing continuous schooling in regular school with vocational subject OR 8th grade pass with 2 yrs relevant experience OR Previous relevant Qualification of NSQF Level 2 with one yr experience OR Previous relevant Qualification of NSQF Level 2.5 with 6 months experience
Trainers Qualification	BE/BTECH IN ELECTRONICS/ELECTRICAL/ELECTRICAL & ELECTRONICS / DIPLOMA IN ELECTRONICS/ELECTRICAL /ELECTRICAL & ELECTRONICS 2 YEARS BE/BTECH, 3 YEARS FOR DIPLOMA

Structure of Course:

Module No.	Module name	Outcome	Theory (Hrs)	Practical (Hrs)	Total (Hrs) [Multiple of 30]
1	Safety in workplace	Apply safe working Practices	10	20	30
2	Basic Electronics components and different parts of a mobile phone	Identify and explain of essential electronics components used in mobile phone along with different parts of a mobile phone	20	40	60
3	Tools and equipment	Identify and discuss the	20	40	60

	used in mobile phone	tools and equipment used in mobile phone			
4	Introduction and working principle of different sections of Mobile phones for assembling and disassembling purpose	Demonstrate the correct procedure for Assembling and dis-assembling different internal parts of a mobile phone	10	20	30
5	Different types of mobile phone faults and to rectify them.	Identify and rectify faults in a Mobile phone.	20	70	90
6	Customer Service and Communication	Provide professional customer service and interact effectively with customers, manage expectations and handle inquiries	10	20	30
7	OJT	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	--	60	60
8	Employability Skill	As per NCVET guided curriculum	60	--	60
TOTAL:			150	270	420

SYLLABUS:**Module No. 1:** Safety in workplace**Outcome:** Apply safe working Practices**Theory Content:**

1. Procedures to achieve a safe working environment in line with occupational health and safety regulations
2. Fire and safety hazards according to workplace policy and procedures.
3. Report preparation for the event of accident or sickness of any staff, including accident details according to accident/injury procedures
4. Personal Protective Equipment (PPE) and their use
5. Basic first aid & CPR
6. Different fire extinguishers and their use

Practical Content:

1. Writing a report regarding any unsafe situations according to workplace policy
2. Demonstrate safety alarms accurately.
3. Prepare report/record in the event of accident or sickness of any staff, including accident details according to accident/injury procedures

4. Demonstrate use of Personal Protective Equipment (PPE) as per related working environment.
5. Demonstrate basic first aid & CPR and use them under different circumstances.
6. Identify different fire extinguishers and use the same as per requirement in a mock drill

Module No. 2: Basic Electronics components and different parts of a mobile phone

Outcome: Identify and explain of essential electronics components used in mobile phone along with different parts of a mobile phone

Theory Content:

1. Study of basic electronics components like coil, non-electrolytic & electrolytic Capacitor, coupler, Rectifier Diode, LED, Zener diode, photo diode, regulator, chip resistance, network resistance, transistor etc.
2. To Study about different parts of mobile phones like
 - Ear piece
 - Mouth piece
 - Battery
 - Power switch
 - Oscillator
 - Screen or display
 - Flash IC
 - Charging IC
 - CPU
3. Study of different types of Mobile phones like
 - Bar Phone
 - Flip Phone
 - Slider Phone
 - Touch screen Phone

Practical Content:

1. Identify electronics components on circuit board
2. Test the components using a multimeter for continuity and resistance
3. Hands-on experience with diode mode testing and voltage measurement

Module No. 3: Tools and equipment used in mobile phone

Outcome: Identify and discuss the tools and equipment used in mobile phone

Theory Content:

To study different types of Hardware tools like

- Soldering Iron
- PCB Holder / PCB Stand
- different Cutters
- Precision Screwdriver
- Tweezers
- Brush
- Multimeter
- Hot Air Blower
- Battery Booster

- Screwdriver Kit
- Microscope
- Test JIG Box
- Battery Tester
- LCD Tester etc.

To study different types of Software tools like

- Tenorshare ReiBoot
- Phone Doctor plus
- All-in-one Toolbox etc.

Practical Content:

1. Soldering technique for fixing of SMD components, ICs and connectors with hot air gun soldering station.
2. Desoldering technique for the removal of components from a PCB.
3. Procedure to measure resistance, voltage and current by using a multimeter for the PCB component of a mobile phone .
4. Procedure to use jumper to bypass faulty components.
5. Use of different types of software tools for repairing like
 - Tenorshare ReiBoot
 - Phone Doctor plus
 - All-in-one Toolbox etc
6. Use of different types of Mobile operating system (Android, Windows, iOS)
7. Use of a Battery Booster and a Battery Tester to boost or to test a Battery.
8. Use of a Test Jig Box to diagnose and find fault in a mobile phone.
9. Use of LCD LED universal tester check the display of a mobile phone.
10. Use of a BGA repair kit to reball and repair ball type ICs.
11. Use of Infrared Workstation for precise soldering and desoldering to prevent damage of nearby electronic components.
12. Use of smoke absorber during soldering and desoldering

Module No. 4: Introduction and working principle of different sections of Mobile phones for assembling and disassembling purpose

Outcome: Demonstrate the correct procedure for Assembling and dis-assembling different internal parts of a mobile phone

Theory Content:

1. Step by step guide to assembling and dis-assembling different mobile phone models.
2. Proper handling and storage of components during disassembly.
3. Techniques for handling fragile components like connectors and flex cables.

Practical Content:

1. Hands on practice in disassembling and reassembling various mobile phone models.
2. Proper techniques for removing delicate components, connectors, flex cables.
3. Identify and avoid common mistakes during disassembly.

Module No. 5: Different types of mobile phone faults and to rectify them.

Outcome: Identify and rectify faults in a mobile phone.

Theory Content:

1. Study to identify and to rectify Hardware faults like
 - Battery charging faults/problems due to false charging, not charging etc.
 - Mobile phone battery problem (faults)
 - Network not working problem
 - Overheating problem
 - Sound faults
 - Ear piece, ringer and microphone problem Lighting or LED problems
 - Keypad problems
 - SIM faults
 - Wi-Fi problem
 - internet connectivity problems
 - Display problems
 - Touch screen problems
2. Study to identify and to rectify Software faults like Display problems
 - No signal message
 - Dead phone set
 - Phone on test mode Phone not charging
 - Phone has message to contact service provider
 - Phone hangs, goes off, freezes or has slow processing
3. Study of different smart phone OS like ANDROID, ios, windows etc.

Practical Content:

1. Use of in built fault diagnostic tool for android mobile phone (e.g by pressing *#0*# we will be able to run a check up of phone's hardware) .Identify the faulty components by cold testing method i.e to use a multimeter to check the value of resistance during powered off condition
2. Identify the faulty components by hot testing method i.e to use a multimeter to check the value of voltage during powered on condition.
3. Interface of Mobile phone with PC to run various software diagnostic tool, formatting and installing of OS
4. Use of handset manufacturer specific technical database for optimal rectification options
5. To rectify the intermittent faults like
 - excess temperature
 - excess current or voltage
 - ionizing radiation
 - mechanical shock
 - stress or impact
 - contamination
 - mechanical stress
 - short circuits
 - imperfect connections
6. To rectify the battery charging faults by
 - Cleaning, re soldering or changing the charger Connector
 - Changing the battery and check again
 - Check the voltage of the battery connector using a Multimeter. The voltage should be between 1.5 and 3.7 Volts.
 - Checking the fuse, coil and regulator one by one and change the faulty part.

- Changing the charging IC.
- Changing the Power IC

7. To rectify Mobile phone battery problem (faults) by

- Checking the battery connector and charging plug
- Upgrading the software to latest version
- Checking the Mobile phone PBA current consumption or any short circuit

8. To rectify the network problem by

- Cleaning the antenna tips and points
- Repairing or replacing the antenna switch
- Repairing or replacing the PFO
- Repairing or replacing Network IC
- Replacing the power IC or CPU

9. To rectify the sound problems by checking

- the speaker and microphone
- Earpiece
- Audio and power IC
- CPU

10. To rectify the display problems by

- Cleaning the display tip and display connector
- De soldering the display connector
- Checking the display track
- Changing the display
- Changing the display IC and /or CPU

11. To rectify the LED problems by

- Checking the light setting and re soldering all the LEDs
- Checking all the LEDs with the multimeter
- Changing the light IC, power IC and display

12. To rectify phone touch screen faults by

- Cleaning , resoldering and/or changing the PDA tips and connectors
- Checking the track of PDA section and/or changing the PDA IC, CPU

13. To rectify keypad problems by

- Cleaning the keypad and keypad points
- Using the multimeter to check the row and column of keypad
- Changing keypad IC/ and or CPU

14. To rectify SIM problems by

- Cleaning the SIM card tips and SIM connectors
- By changing the SIM card, SIM IC and power IC

15. To rectify software problems by

- Removing the application software that causes problems
- Reset the factory setting of mobile phones and update the software

Module No. 6: Customer Service and Communication

Outcome: Provide professional customer service and interact effectively with customers, manage expectations and handle inquiries

Theory Content:

1. Maintain open and clear lines of communication with customers.
2. Effective communication skills for interacting with customers.
3. Clearly explain the pricing structure for repairs and any associated fees.
4. Utilized automated SMS or email notifications to alert customers when their device is received, being repaired and ready for pick up
5. Managing customer expectations and handling complaints.
6. Building customer trust and loyalty through quality service.
7. Encourage customers to provide feedback and reviews about their repair experience.

Practical Content:

1. Role-play scenarios for effective customer communication.
2. Handle customer inquiries, requests, complaints.
3. Build customer trust and provide quality service.

Module No. 7: OJT

Outcome: Work in real job situation with special emphasis on basic safety and hazards in this domain

Practical Content:

Assessor will check report prepared for this component of Practical training of the course and assess whether competency has been developed to work in the real job situation with special emphasis on basic safety and hazards in this domain. (The trainee is expected to undertake work in actual workplace under any supervisor / contractor for **60 Hours.**)

Module No. 8: Employability Skills (60 Hrs)**Key Learning Outcomes****Introduction to Employability Skills**

Duration: 1.5 Hours

After completing this programme, participants will be able to:

1. Discuss the Employability Skills required for jobs in various industries
2. List different learning and employability related GOI and private portals and their usage

Constitutional values - Citizenship

Duration: 1.5 Hours

3. Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen
4. Show how to practice different environmentally sustainable practices.

Becoming a Professional in the 21st Century

Duration: 2.5 Hours

5. Discuss importance of relevant 21st century skills.
6. Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life.
7. Describe the benefits of continuous learning.

Basic English Skills

Duration: 10 Hours

8. Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone
9. Read and interpret text written in basic English
10. Write a short note/paragraph / letter/e -mail using basic English

Career Development & Goal Setting

Duration: 2 Hours

11. Create a career development plan with well-defined short- and long-term goals

Communication Skills

Duration: 5 Hours

12. Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette.
13. Explain the importance of active listening for effective communication
14. Discuss the significance of working collaboratively with others in a team

Diversity & Inclusion

Duration: 2.5 Hours

15. Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD
16. Discuss the significance of escalating sexual harassment issues as per POSH act.

Financial and Legal Literacy

Duration: 5 Hours

17. Outline the importance of selecting the right financial institution, product, and service
18. Demonstrate how to carry out offline and online financial transactions, safely and securely
19. List the common components of salary and compute income, expenditure, taxes, investments etc.
20. Discuss the legal rights, laws, and aids

Essential Digital Skills

Duration: 10 Hours

21. Describe the role of digital technology in today's life
22. Demonstrate how to operate digital devices and use the associated applications and features, safely and securely
23. Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and securely
24. Create sample word documents, excel sheets and presentations using basic features
25. utilize virtual collaboration tools to work effectively

Entrepreneurship

Duration: 7 Hours

26. Explain the types of entrepreneurship and enterprises
27. Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan
28. Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per

requirement

29. Create a sample business plan, for the selected business opportunity

Customer Service

Duration: 5 Hours

30. Describe the significance of analyzing different types and needs of customers
 31. Explain the significance of identifying customer needs and responding to them in a professional manner.
 32. Discuss the significance of maintaining hygiene and dressing appropriately

Getting Ready for apprenticeship & Jobs

Duration: 8 Hours

33. Create a professional Curriculum Vitae (CV)
 34. Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively
 35. Discuss the significance of maintaining hygiene and confidence during an interview
 36. Perform a mock interview
 37. List the steps for searching and registering for apprenticeship opportunities

Learning Outcome – Assessment Criteria

Module No.	Outcome	Assessment Criteria
1	Apply safe working Practices	<p>After completion of this module students will be able to:</p> <ol style="list-style-type: none"> 1. Trainees will be able to maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements according to workplace policy. 2. Trainees will be able to recognize any unsafe situations according to workplace policy, and assess his report accordingly. 3. Trainees will be able to take necessary precautions on fire and safety hazards and report according to workplace policy and procedures. 4. Trainees will be able to demonstrate safety alarms accurately. 5. Trainees will be able to prepare report/record in the event of accident or sickness of any staff, including accident details according to accident/injury procedures 6. Trainees will be asked to demonstrate Personal Protective Equipment (PPE) and use the same as per related working environment. 7. Trainees will be asked to demonstrate basic first aid & CPR and use them under different circumstances. 8. Trainees will be asked to identify different fire extinguishers and to use the same as per

Module No.	Outcome	Assessment Criteria
		requirement in a mock drill
2	Identify and explain of essential electronics components used in mobile phone along with different parts of a mobile phone	<p>After completion of this module students will be able to:</p> <ol style="list-style-type: none"> 1. Identify basic electronics components like coil, non-electrolytic & electrolytic Capacitor, coupler, Rectifier Diode, LED, Zener diode, photo diode, regulator, chip resistance, network resistance, transistor etc. 2. Test basic electronics components as mentioned above. 3. Identify different parts of mobile phones like Earpiece, Mouth piece, Battery, power switch, oscillator, display, flash IC, Charging IC, CPU, etc. 4. Identify the types of Mobile Handsets like Bar, Brick, Touch screen, Flip, Slider etc.
3	Identify and discuss the tools and equipment used in mobile phone	<p>After completion of this module students will be able to:</p> <ol style="list-style-type: none"> 1. Use the different hardware tools like <ul style="list-style-type: none"> ● PCB Holder / PCB Stand ● different Cutters ● Precision Screwdriver ● Tweezers ● Brush ● Multimeter ● Hot Air Blower ● Battery Booster ● Screwdriver Kit ● Microscope ● Test JIG Box ● Battery Tester ● LCD Tester etc. 2. Use the different software tools like <ul style="list-style-type: none"> ● Tenorshare ReiBoot ● Phone Doctor plus ● All-in-one Toolbox etc. 3. Demonstrate soldering & desoldering of SMD components, ICs and connectors from a PCB with hot air gun soldering station and infrared workstation.

Module No.	Outcome	Assessment Criteria
4	Demonstrate the correct procedure for Assembling and dis-assembling different internal parts of a mobile phone	<p>After completion of this module students will be able to:</p> <ol style="list-style-type: none"> 1. Assemble and disassemble different internal Parts of a Mobile Phone like <ul style="list-style-type: none"> ● SIM card section ● Memory card section ● Ear Speaker Section ● Speaker/Ringer Section ● Key Backlight Section ● LCD Backlight Section ● Vibrator Motor Section ● Network Section ● Battery Charging Section ● FM Radio Section ● Bluetooth Section ● Hands free (Earphone) Section
5	Identify and rectify faults in a mobile phone.	<p>After completion of this module students will be able to:</p> <ol style="list-style-type: none"> 1. Identify and rectify Hardware Faults like <ul style="list-style-type: none"> ● Battery charging faults/problems ● Mobile phone battery problem (faults) ● Network not working problem ● Overheating problem ● Sound faults ● Earpiece, ringer and microphone problem ● Lighting or LED problems ● Keypad problems ● SIM faults ● WiFi problem ● internet connectivity problems ● Display problems ● Touchscreen problems 2. Identify and rectify software faults like <ul style="list-style-type: none"> ● Display problems ● No signal message ● Dead phone set ● Phone on test mode Phone not charging ● Phone has message to contact service provider ● Phone hangs, goes off, freezes or has slow processing 3. Rectify faults by circuit tracking through standard practice like measuring of voltage, resistance, current by multimeter and use of jumper to bypass the faulty circuit. 4. Demonstrate formatting, & Flashing technique of a Mobile phone. 5. Remove virus from a mobile phone 6. Unlock smartphones through software

Module No.	Outcome	Assessment Criteria
6	Provide professional customer service and interact effectively with customers, manage expectations and handle inquiries	<p>After completion of this module students will be able to:</p> <ol style="list-style-type: none"> 1. Develop the ability to actively listen and comprehend customer inquiries. 2. Demonstrate the importance of interacting with customers. 3. Analyze complex customer issues and identify root causes. 4. Develop time management effectively during customer interactions. 5. Explain the need to suggest possible solutions. 6. Offer post repair support to assist customers who encounter difficulties after receiving their device.
7	OJT	Assessor will check report prepared for this component of Practical training of the course and assess whether competency has been developed to work in the real job situation with special emphasis on basic safety and hazards in this domain. (The trainee is expected to undertake work in actual workplace under any supervisor / contractor for 60 Hours.)
8	Employability Skill	As per NCVET guided curriculum

List of Tools, Equipment & materials needed for 30 Trainees

SI No	Items Name	Specification	Qty
1	Soldering Iron		6 nos
2	PCB Holder / PCB Stand		4 nos
3	Solder Wire		As required
4	DC regulated power supply		4 nos
5	Multimeter		4 nos
6	Antistatic Mat with antistatic wrist band (ESD Mat)		As required
7	Microscope or Magnifier		1 no
8	Magnifying Lamp		1 no
9	Hot air soldering station		2 nos
10	Battery Booster		2 nos
11	Normal and precision Screwdriver kit		6 nos
12	Test Jig box		4 nos
13	Battery tester		4 nos
14	Universal LED, LCD Tester		4 nos
15	PDA repair kit		4 nos
16	Infrared workstation		4 nos

Marks Distribution

Outcome	Outcome Code	Total Th marks	Total Pr marks
Apply safe working Practices	ELE/1021/OC1	20	100
Identify and explain of essential electronics components used in mobile phone along with different parts of a mobile phone	ELE/1021/OC2	30	130
Identify and discuss the tools and equipment used in mobile phone	ELE/1021/OC3	30	120
Demonstrate the correct procedure for Assembling and dis-assembling different internal parts of a mobile phone	ELE/1021/OC4	20	100
Identify and rectify faults in a Mobile phone.	ELE/1021/OC5	30	100
Provide professional customer service and interact effectively with customers, manage expectations and handle inquiries	ELE/1021/OC6	20	100
Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	ELE/1021/OC7	0	150
Employability Skill-60 Hrs	DGT/VSQ/N0102	50	0