

Module 2: Mobile Disassembly & Assembly (Classes 4–7)

Module Duration: 8 Hours (4 Classes × 2 Hours)

Module Overview

This module provides students with practical skills in safely disassembling and reassembling smartphones. Students will learn professional techniques for opening different types of mobile phones, disconnecting batteries, handling delicate flex cables, replacing displays, reconnecting internal components, inspecting connectors, and performing complete functional testing after repair. Emphasis is placed on ESD safety, correct tool usage, and manufacturer-recommended repair procedures.

Module Learning Objectives

After completing this module, students will be able to:

- Safely disassemble different smartphone models.
 - Remove back covers and displays without causing damage.
 - Disconnect and reconnect batteries safely.
 - Handle flex cables and connectors correctly.
 - Reassemble smartphones using proper procedures.
 - Install displays and waterproof seals.
 - Identify and inspect major mobile connectors.
 - Perform complete hardware functionality tests after repair.
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Class 4 (2 Hours)

Mobile Disassembly Techniques

Learning Outcomes

After completing this class, students will be able to:

- Follow safe smartphone disassembly procedures.
 - Remove back covers without damaging the device.
 - Disconnect the battery safely.
 - Remove the display assembly correctly.
 - Handle flex cables using proper techniques.
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4.1 Introduction to Mobile Disassembly

Mobile disassembly is the process of opening a smartphone to inspect, repair, or replace internal components.

Reasons for Disassembly

- Display replacement
 - Battery replacement
 - Charging port repair
 - Camera replacement
 - Motherboard repair
 - Cleaning water-damaged devices
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4.2 Preparation Before Disassembly

Before opening a smartphone:

- Power off the device.
 - Remove the SIM tray.
 - Wear an ESD wrist strap.
 - Prepare a clean workbench.
 - Organize screws using a magnetic mat.
 - Gather all required repair tools.
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4.3 Removing the Back Cover

Types of Back Covers

- Plastic
- Glass
- Metal

Removal Procedure

- Heat the edges (for adhesive-backed phones).
 - Use a suction cup to lift the cover.
 - Insert a plastic opening pick.
 - Carefully separate the adhesive.
 - Avoid inserting tools too deeply to prevent damage to internal flex cables.
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4.4 Disconnecting the Battery

The battery must always be disconnected before servicing internal components.

Steps

1. Remove protective brackets.
 2. Disconnect the battery connector using a plastic pry tool.
 3. Ensure no power remains before continuing.
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4.5 Display Removal

Display assemblies may include:

- LCD Display
- OLED Display
- Touch Digitizer

Removal Steps

- Heat the display edges.
 - Separate adhesive carefully.
 - Disconnect display flex cables.
 - Remove the display assembly safely.
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4.6 Flex Cable Handling

Flex cables connect various components to the motherboard.

Safety Guidelines

- Never pull on flex cables.
 - Lift connectors gently.
 - Avoid bending cables sharply.
 - Keep connectors clean and dust-free.
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Practical Exercise

Students will:

- Safely power off a smartphone.
 - Remove the SIM tray.
 - Open the back cover.
 - Disconnect the battery.
 - Remove the display assembly.
 - Inspect flex cable routing.
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Assignment

Draw the correct smartphone disassembly sequence and label each step.

Class 5 (2 Hours)

Mobile Assembly

Learning Outcomes

Students will be able to:

- Reassemble smartphones correctly.
 - Reconnect internal components.
 - Install displays properly.
 - Install batteries safely.
 - Replace waterproof seals.
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5.1 Mobile Assembly Process

Assembly is performed in the reverse order of disassembly.

Assembly Checklist

- Motherboard secured
 - Flex cables connected
 - Battery installed
 - Cameras installed
 - Speaker installed
 - Charging board installed
 - Display installed
 - Back cover installed
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5.2 Reconnecting Components

Reconnect all flex cables carefully.

Common Connections

- Display Flex
 - Battery Flex
 - Camera Flex
 - Fingerprint Flex
 - Charging Board Flex
 - Button Flex
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5.3 Installing the Display

Steps

- Remove old adhesive.
 - Clean the frame.
 - Apply new display adhesive.
 - Connect display flex cable.
 - Position the display correctly.
 - Press evenly to secure.
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5.4 Installing the Battery

Battery Installation

- Inspect the battery for damage.
 - Apply new adhesive strips if required.
 - Install the battery.
 - Connect the battery flex cable.
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5.5 Waterproof Seals

Many modern smartphones use waterproof adhesive seals.

Importance

- Prevent water entry
- Prevent dust entry
- Maintain IP rating

Always replace damaged seals after opening the phone.

Practical Exercise

Students will:

- Reconnect all internal components.
 - Install a replacement display.
 - Install the battery.
 - Replace waterproof adhesive.
 - Reassemble the smartphone.
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Assignment

Explain why waterproof seals should always be replaced after repair.

Class 6 (2 Hours)

Mobile Connectors

Learning Outcomes

Students will be able to:

- Identify common smartphone connectors.
 - Inspect connectors for damage.
 - Reconnect flex cables safely.
 - Diagnose loose connector problems.
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6.1 Mobile Connectors

A connector joins a component to the motherboard.

Common connectors include:

- Charging Port Connector
 - Display Connector
 - Battery Connector
 - Camera Connector
 - Fingerprint Connector
 - Volume Button Connector
 - Power Button Connector
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6.2 Charging Port Connector

Functions

- Charging
- USB Data Transfer
- OTG Support

Common Problems

- Loose connector
- Corrosion

- Broken pins
 - Dust accumulation
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6.3 Display Connector

The display connector carries:

- Video signals
- Touch signals
- Backlight power

Common Faults

- No display
 - Flickering
 - Touch not working
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6.4 Battery Connector

Functions

- Power delivery
- Battery communication
- Charging management

Common Problems

- Loose connection
 - Bent pins
 - Corrosion
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6.5 Camera Connector

Connects:

- Rear Camera
- Front Camera
- Flash Module

Symptoms of Fault

- Camera not detected
 - Blurry images
 - Camera application crashes
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6.6 Fingerprint Connector

Supports:

- Fingerprint sensor
 - Face ID support (device dependent)
 - Biometric authentication
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6.7 Connector Inspection

Inspection Procedure

- Use a microscope.
 - Check for bent pins.
 - Check for corrosion.
 - Clean connectors using isopropyl alcohol.
 - Reconnect flex cables securely.
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Practical Exercise

Students will:

- Inspect all motherboard connectors.
 - Disconnect and reconnect flex cables.
 - Clean connectors safely.
 - Verify connector seating under a microscope.
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Assignment

Prepare a diagram showing the location and function of smartphone connectors.

Class 7 (2 Hours)

Mobile Hardware Testing

Learning Outcomes

Students will be able to:

- Perform complete post-repair testing.
- Verify hardware functionality.
- Identify defective components.
- Complete a repair quality checklist.

7.1 Power Test

Verify:

- Phone powers on normally.
- Battery charging indicator.
- Boot sequence.
- Restart operation.

7.2 Display Test

Check:

- Brightness
- Color quality
- Dead pixels
- Screen flickering
- Backlight

7.3 Touch Test

Verify:

- Multi-touch
 - Touch accuracy
 - Edge response
 - Gesture support
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7.4 Camera Test

Check:

- Rear camera
 - Front camera
 - Flash
 - Autofocus
 - Video recording
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7.5 Speaker & Microphone Test

Test:

- Loudspeaker
 - Earpiece speaker
 - Primary microphone
 - Secondary microphone
 - Headphone audio (if applicable)
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7.6 Additional Hardware Tests

- Charging Function
- Fingerprint Sensor
- Face Unlock (if available)
- Wi-Fi
- Bluetooth
- Mobile Network
- SIM Detection
- GPS
- Vibration Motor
- Volume Buttons

- Power Button
 - Proximity Sensor
 - Ambient Light Sensor
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7.7 Quality Control Checklist

Before returning a repaired phone:

- Device boots successfully.
 - Display functions correctly.
 - Touchscreen responds accurately.
 - Battery charges normally.
 - Cameras operate correctly.
 - Speakers and microphones work properly.
 - Wi-Fi and Bluetooth connect successfully.
 - SIM card is detected.
 - Fingerprint sensor functions correctly.
 - No loose screws or gaps in the housing.
 - Waterproof seal is properly installed (where applicable).
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Practical Exercise

Students will:

- Assemble a smartphone completely.
 - Perform a full functional hardware inspection.
 - Test all major hardware features.
 - Record test results on a quality control checklist.
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Assignment

Prepare a complete smartphone post-repair inspection checklist for use in a mobile service center.

Software & Tools Used

- Precision Screwdriver Set
- Plastic Opening Picks
- Metal Pry Tools
- Suction Cup
- Tweezers
- SIM Ejector Tool
- ESD Wrist Strap
- ESD Mat
- Digital Microscope
- Isopropyl Alcohol (90%+)
- Microfiber Cloth
- Display Adhesive
- Waterproof Adhesive Seals
- Magnetic Screw Mat
- Multimeter
- DC Power Supply

Practical Projects

- Safe Smartphone Disassembly
- Display Removal and Installation
- Battery Removal and Replacement
- Flex Cable Inspection and Reconnection
- Connector Cleaning and Testing
- Complete Smartphone Reassembly
- Full Hardware Functional Testing
- Post-Repair Quality Inspection

Module Assessment

Assessment	Marks
Quiz	10
Practical Exercises	30
Smartphone Disassembly & Assembly Project	30
Hardware Testing & Quality Inspection	20
Viva	10
Total	100

Module Learning Outcomes

After successfully completing **Module 2: Mobile Disassembly & Assembly**, students will be able to:

- Safely disassemble and reassemble smartphones using professional repair procedures.
- Remove and reinstall displays, batteries, and internal components without damaging delicate parts.
- Identify, inspect, clean, and reconnect major smartphone connectors and flex cables.
- Replace waterproof adhesive seals to help maintain device protection after repair.
- Perform comprehensive post-repair testing, including power, display, touch, camera, audio, charging, connectivity, and sensor verification.
- Apply industry-standard ESD safety practices, proper tool handling, and quality control methods to deliver reliable and professional mobile hardware repair services.