Module 6: Software, Customer Service & Final Project (Classes 21–24)

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

Module Overview

This final module combines mobile software servicing, customer service, business management, and a comprehensive practical project. Students will learn how to install Android firmware, perform factory resets, understand Factory Reset Protection (FRP), create backups, conduct software diagnostics, optimize device performance, prepare professional repair documentation, manage customers, understand warranty policies, and develop basic business and freelancing skills. The module concludes with a capstone project where students repair, configure, test, and present a fully functional smartphone.

Module Learning Objectives

After completing this module, students will be able to:

- Install and update Android firmware safely.
- Perform factory resets and understand FRP.
- Create and restore mobile data backups.
- Conduct software diagnostics and performance optimization.
- Understand IMEI concepts and mobile security.
- Prepare professional repair reports and service documentation.
- Apply customer service and warranty management practices.
- Plan a mobile repair business or freelance career.
- Complete a full smartphone repair project from diagnosis to presentation.

Class 21 (2 Hours)

Android Flashing & Software Installation

Learning Outcomes

After completing this class, students will be able to:

- Explain Android firmware.
- Install stock firmware safely.
- Perform factory resets.
- Understand Factory Reset Protection (FRP).
- Create backups and restore user data.

21.1 Android Firmware

Firmware is the operating system software stored in the phone's internal memory that controls hardware functions.

Types of Firmware

- Stock Firmware
- Official Firmware
- Custom ROM
- OTA (Over-the-Air) Updates

21.2 Android Flashing

Flashing is the process of installing or reinstalling firmware on a smartphone.

Reasons for Flashing

- Software corruption
- Boot loop
- System update
- Virus removal
- Performance issues
- Restoring factory software

21.3 Flashing Tools (Overview)

Common manufacturer or platform tools include:

- Samsung Odin

- SP Flash Tool (MediaTek)
- QFIL/QPST (Qualcomm)
- Fastboot
- ADB (Android Debug Bridge)

Note: Always use official firmware that matches the exact device model to reduce the risk of software incompatibility.

21.4 Factory Reset

A factory reset restores the phone to its original software settings.

Uses

- Remove user data
- Resolve software issues
- Improve performance
- Prepare a device for resale

21.5 Factory Reset Protection (FRP)

FRP is a Google security feature that helps prevent unauthorized use after a factory reset.

Purpose

- Protect user data
- Reduce device theft
- Require the previously synced Google account after a reset (when applicable)

Ethical and Legal Note: Technicians should perform FRP-related work only with proper customer authorization and ownership verification.

21.6 Backup & Restore

Before servicing a device, important data should be backed up whenever possible.

Backup Options

- Google Account Backup
- Local Backup
- Cloud Storage
- External Storage

Data Types

- Contacts
- Photos
- Videos
- Messages
- Applications
- Documents

Practical Exercise

Students will:

- Identify the correct firmware for a training device.
- Perform a backup.
- Install stock firmware on a practice device.
- Complete a factory reset.
- Restore backed-up data.

Assignment

Explain the importance of firmware, backups, and FRP in smartphone servicing.

Class 22 (2 Hours)

IMEI, Mobile Security & Device Optimization

Learning Outcomes

Students will be able to:

- Explain the purpose of IMEI.
- Understand mobile security features.
- Perform software diagnostics.
- Optimize smartphone performance.

22.1 IMEI Basics

The **International Mobile Equipment Identity (IMEI)** is a unique identification number assigned to each mobile device.

Uses

- Device identification
- Warranty verification
- Network registration
- Blacklist checking by carriers

Important: Technicians should never alter or tamper with an IMEI. In many jurisdictions, changing an IMEI is illegal.

22.2 Mobile Security

Common security features include:

- Screen Lock
- Fingerprint Authentication
- Face Unlock
- Device Encryption
- Secure Boot
- Find My Device

22.3 Software Diagnostics

Technicians should verify:

- System stability
- Battery usage
- Storage utilization
- Installed applications

- Error logs (where available)
- Update status

22.4 Performance Optimization

Methods include:

- Removing unnecessary apps
- Clearing cache
- Updating software
- Managing startup/background applications
- Freeing storage space
- Restarting the device after maintenance

22.5 Final Device Testing

Check:

- Boot performance
- Battery charging
- Wi-Fi
- Bluetooth
- Camera
- Display
- Touchscreen
- Audio
- Sensors

Practical Exercise

Students will:

- Review IMEI information.
- Perform a software health check.
- Optimize a device's performance.
- Complete a software diagnostic checklist.

Assignment

Prepare a checklist for post-repair software testing and optimization.

Class 23 (2 Hours)

Customer Service & Mobile Repair Business

Learning Outcomes

Students will be able to:

- Communicate professionally with customers.
- Prepare repair documentation.
- Understand warranty policies.
- Calculate repair pricing.
- Plan a mobile repair business.

23.1 Customer Handling

Professional technicians should:

- Listen carefully to customer concerns.
- Explain repair procedures clearly.
- Discuss estimated costs and timelines.
- Obtain approval before beginning repairs.
- Maintain confidentiality of customer data.

23.2 Repair Documentation

Service records should include:

- Customer information
- Device model
- Reported problem
- Diagnostic findings

- Parts replaced
- Repair actions
- Final test results

23.3 Service Reports

A professional report should contain:

- Job number
- Device condition
- Work performed
- Components replaced
- Software updates (if any)
- Technician name
- Customer signature (where applicable)

23.4 Warranty Guidelines

Warranty policies should clearly define:

- Warranty period
- Covered repairs
- Exclusions
- Physical damage conditions
- Water damage limitations
- Customer responsibilities

23.5 Pricing & Business Management

Pricing should consider:

- Cost of replacement parts
- Labor charges
- Equipment expenses
- Business overhead
- Profit margin

Basic business practices:

- Inventory management
- Record keeping
- Customer database
- Marketing
- Quality assurance

23.6 Freelancing & Mobile Repair Shop Setup

Possible career paths:

- Home-based repair service
- Mobile repair shop
- Authorized service center
- On-site repair service
- Freelance technician
- Online repair consultation

Essential Equipment

- Professional repair bench
- Diagnostic tools
- Soldering equipment
- Microscope
- Computer with repair software
- Inventory storage

Practical Exercise

Students will:

- Create a customer repair form.
- Prepare a repair quotation.
- Write a professional service report.
- Develop a simple business plan for a mobile repair service.

Assignment

Design a service workflow from customer check-in to device delivery.

Class 24 (2 Hours)

Final Practical Project

Learning Outcomes

Students will be able to:

- Apply complete hardware and software repair procedures.
- Diagnose and repair smartphone faults.
- Test repaired devices.
- Present repair findings professionally.

24.1 Final Project Workflow

Students will complete the following tasks:

Step 1 – Device Inspection

- Visual inspection
- Customer complaint review
- Physical condition assessment

Step 2 – Hardware Diagnosis

- Check battery
- Inspect motherboard
- Test connectors
- Measure voltages
- Identify faulty components

Step 3 – Component Replacement

Possible replacement tasks include:

- Display
- Battery
- Charging Port
- Camera
- Speaker
- Microphone
- Fingerprint Sensor
- Flex Cable

Step 4 – Software Installation

Students will:

- Install firmware (if required)
- Perform system updates
- Configure Android settings
- Restore backed-up data (when applicable)

Step 5 – Functional Testing

Verify:

- Power
- Charging
- Display
- Touchscreen
- Cameras
- Audio
- Wi-Fi
- Bluetooth
- Mobile Network
- Sensors
- Fingerprint
- Battery Performance

Step 6 – Quality Inspection

Complete a final checklist to ensure:

- Device is fully functional.

- No loose screws or connectors remain.
- Cosmetic condition is acceptable.
- Customer data has been handled appropriately.
- Repair documentation is complete.

Step 7 – Viva & Presentation

Students will present:

- Fault diagnosis
- Repair procedure
- Components replaced
- Software work completed
- Final testing results
- Lessons learned during the repair

Practical Exercise

Students will:

- Disassemble a smartphone.
- Diagnose hardware and software faults.
- Replace defective components.
- Reassemble the device.
- Install or update software where appropriate.
- Perform complete quality testing.
- Prepare repair documentation.
- Present the completed project.

Software & Tools Used

- Windows 10/11 Computer
- Android USB Drivers
- ADB (Android Debug Bridge)
- Fastboot
- Samsung Odin
- SP Flash Tool (MediaTek)
- QFIL/QPST (Qualcomm)
- Digital Multimeter

- DC Regulated Power Supply
- Digital Microscope
- Precision Screwdriver Set
- Plastic Opening Tools
- Hot Air Rework Station
- Soldering Station
- ESD Wrist Strap
- ESD Mat
- Isopropyl Alcohol (90%+)

Final Practical Projects

- Android Firmware Installation
- Factory Reset & Data Backup
- Software Diagnostics & Performance Optimization
- Customer Repair Documentation
- Hardware Fault Diagnosis
- Smartphone Disassembly & Assembly
- Component Replacement
- Complete Device Functional Testing
- Full Smartphone Repair & Presentation

Module Assessment

Assessment	Marks
Quiz	10
Practical Exercises	20
Software Installation & Diagnostics	20
Final Practical Repair Project	40
Viva & Presentation	10
Total	**100**

Module Learning Outcomes

After successfully completing **Module 6: Software, Customer Service & Final Project**, students will be able to:

- Install and restore official Android firmware using appropriate service tools and follow safe software servicing procedures.
- Perform factory resets, create and restore backups, and understand the purpose of Factory Reset Protection (FRP) while respecting legal and ethical responsibilities.
- Conduct software diagnostics, optimize device performance, and verify the functionality of key hardware and software features after repair.
- Prepare professional customer documentation, repair reports, warranty records, and repair quotations while delivering effective customer service.
- Apply basic business management principles to establish and operate a mobile phone repair service or freelance repair business.
- Independently diagnose, repair, configure, test, document, and professionally present a fully functional smartphone by integrating the hardware and software skills acquired throughout the 48-hour Mobile Hardware Repair course.