



ABROL TechSkill Academy

1-Month Pro Level Certification

CCTV & Security Systems

Duration: 1 month

Level: Beginner / Pro Foundation

Mode: 30% Theory | 70% Practical

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Welcome Message

Welcome to the 1-Month Pro Level Certification in CCTV & Security Systems. We are delighted to have you join this industry-focused training program designed to build practical skills in modern electronic security systems.

Today's world demands reliable surveillance and security solutions for homes, businesses, industries, educational institutions, hospitals, banks, hotels, and government organizations. As the need for safety and security continues to grow, skilled CCTV and Security System professionals are in high demand across various industries.

This course has been specially developed for beginners, students, electricians, technicians, entrepreneurs, and working professionals who wish to start or strengthen their careers in the electronic security industry. The training follows a 30% Theory and 70% Practical approach, ensuring that every participant gains both technical knowledge and real hands-on experience with industry-standard equipment.

Throughout this program, you will learn how to install, configure, test, troubleshoot, and maintain CCTV Surveillance Systems, Access Control Systems, Biometric Attendance Devices, and Intruder Alarm Systems while following professional installation standards and safety practices.

Whether your goal is to secure employment, start your own installation business, or upgrade your technical skills, this course will provide a strong foundation for your professional growth.

We wish you a successful learning journey and look forward to helping you become a skilled CCTV & Security Systems professional.

Course Introduction

The CCTV & Security Systems Certification Program is a one-month industry-oriented course that focuses on practical skills required for installing and maintaining modern security systems.

The training begins with the fundamentals of electronic security and gradually moves toward practical installation of Analog HD CCTV, IP CCTV, DVRs, NVRs, cameras, cabling, networking, mobile viewing, Access Control Systems, Biometric Devices, and Intruder Alarm Systems.

The course emphasizes real-world installation techniques, equipment handling, troubleshooting, customer support, and safety practices. By completing this program, learners will gain the confidence to work independently as CCTV and Security System Technicians or start their own installation and maintenance business.

The training consists of 30% Theory and 70% Practical, ensuring that every participant gains hands-on experience with real equipment and installation procedures.

Course Motive

The primary motive of this course is to bridge the gap between theoretical knowledge and practical industry skills.

This program aims to prepare learners with the technical knowledge and confidence required to install, configure, maintain, and troubleshoot basic electronic security systems used in residential, commercial, and industrial environments.

After completing this course, participants will be able to:

- Understand the fundamentals of CCTV and electronic security systems.
- Identify different types of CCTV cameras and security devices.
- Install CCTV cameras using professional installation techniques.
- Perform cable routing, cable termination, and power connections.
- Configure DVRs, NVRs, and IP Camera Systems.
- Enable remote viewing through mobile phones and computers.
- Understand the basics of Access Control and Biometric Systems.
- Install and test basic Intruder Alarm Systems.
- Diagnose and troubleshoot common system faults.
- Follow industry safety standards and best installation practices.
- Build confidence for employment or self-employment in the electronic security industry.

Learning Outcomes

After successfully completing this certification, learners will be able to:

- ✓ Explain the purpose and importance of electronic security systems.
- ✓ Differentiate between Analog, HD, and IP CCTV technologies.
- ✓ Select suitable CCTV equipment according to customer requirements.
- ✓ Install and commission a complete CCTV surveillance system.
- ✓ Configure recording settings, storage, networking, and remote access.
- ✓ Install basic Access Control and Biometric Attendance Systems.
- ✓ Install and test Intruder Alarm Systems.
- ✓ Perform routine maintenance and fault diagnosis.
- ✓ Apply professional installation standards and electrical safety practices.
- ✓ Work as an entry-level CCTV & Security Systems Technician or start a basic installation business.

Course Structure

Module	Module Name	Duration
1	Introduction to CCTV & Electronic Security	2 Days
2	CCTV Cameras & System Components	2 Days
3	CCTV Cables, Connectors & Power Supply	2 Days
4	DVR, NVR & IP CCTV Systems	2 Days
5	CCTV Installation (Theory + Practical)	3 Days
6	CCTV Configuration & Mobile Monitoring	2 Days
7	Access Control & Biometric Systems	3 Days
8	Intruder Alarm System Installation	2 Days
9	System Maintenance, Troubleshooting & Final Practical Project	4 Days

MODULE 1

Introduction to CCTV & Electronic Security Systems

Module Objective

The objective of this module is to introduce learners to the fundamentals of CCTV and electronic security systems. Participants will understand the purpose of surveillance, the importance of security systems, different applications of CCTV, and the basic components used in modern surveillance solutions.

1. What is CCTV?

CCTV (Closed-Circuit Television) is a video surveillance system used to monitor, record, and protect people, property, and valuable assets. Unlike television broadcasting, CCTV transmits video only to authorized devices for security purposes.

2. Importance of CCTV Systems

CCTV systems help prevent theft, monitor daily activities, improve workplace safety, collect evidence during incidents, and enhance overall security in residential, commercial, and industrial environments.

3. Applications of CCTV

CCTV is widely used in homes, offices, factories, schools, colleges, hospitals, hotels, banks, shopping malls, warehouses, parking areas, airports, railway stations, and government organizations.

4. Types of Security Systems

Modern electronic security includes CCTV Surveillance, Access Control Systems, Biometric Attendance Systems, Video Door Phones, Intruder Alarm Systems, Fire Alarm Systems, and Perimeter Security Solutions.

5. Basic Components of a CCTV System

A standard CCTV system consists of cameras, DVR/NVR, hard disk, power supply, cables, connectors, monitor, network devices, and mobile viewing applications.

6. Benefits of CCTV Surveillance

CCTV improves security, reduces crime, enables remote monitoring, supports investigations, increases employee discipline, and provides peace of mind for property owners.

7. Responsibilities of a CCTV Technician

A CCTV technician is responsible for site surveys, equipment selection, installation, cable routing, testing, configuration, maintenance, troubleshooting, and customer support.

8. Safety Precautions During Installation

Always switch off power before wiring, use insulated tools, wear safety equipment, use proper ladders, follow electrical safety rules, and keep the workplace organized to prevent accidents.

9. Career Opportunities in CCTV & Security Systems

After completing this course, learners can work as CCTV Installation Technicians, Service Engineers, Security System Integrators, Technical Support Executives, Site Supervisors, or start their own CCTV installation business.

10. Future of Electronic Security

The future of security includes AI-based surveillance, smart analytics, facial recognition, cloud storage, IoT-enabled devices, remote monitoring, and integrated smart security solutions.

Practical Session

Students will perform the following activities:

- *Identify different CCTV cameras.*
- *Observe DVR and NVR units.*
- *Identify CCTV cables and connectors.*
- *Understand the purpose of each CCTV component.*
- *Visit a demo CCTV installation setup.*
- *Learn basic handling of CCTV equipment.*
- *Practice workplace safety procedures.*

Notes

At the end of this module, learners should be able to:

- **Explain the purpose of CCTV.**
- **Identify major applications of surveillance systems.**
- **Understand the basic components of a CCTV system.**
- **Recognize different electronic security systems.**
- **Follow essential installation safety practices.**
- **Understand career opportunities in the CCTV and security industry.**

MODULE 2

CCTV Cameras & System Components

Module Objective

The objective of this module is to familiarize learners with the various types of CCTV cameras and the essential components used in surveillance systems. Students will understand the purpose, features, and applications of each device, enabling them to select suitable equipment for different installation environments.

1. Types of CCTV Cameras

CCTV cameras are available in different types such as Dome, Bullet, PTZ, IP, Wi-Fi, Turret, and Fisheye cameras. Each camera is designed for specific surveillance requirements based on the installation location and monitoring purpose.

2. Dome Cameras

Dome cameras are compact, vandal-resistant cameras mainly used indoors in offices, schools, hospitals, hotels, and shopping malls. Their design makes it difficult to determine the viewing direction.

3. Bullet Cameras

Bullet cameras are long cylindrical cameras mainly installed outdoors. They provide long-distance viewing and are weatherproof, making them ideal for parking areas, factories, warehouses, and building perimeters.

4. PTZ (Pan-Tilt-Zoom) Cameras

PTZ cameras can rotate horizontally, vertically, and zoom in or out. These cameras are commonly used for large areas such as airports, railway stations, stadiums, and industrial premises.

5. IP Cameras and Wi-Fi Cameras

IP cameras transmit video through computer networks and provide high-resolution images. Wi-Fi cameras connect wirelessly, making installation easier for homes and small offices.

6. DVR (Digital Video Recorder)

A DVR records video from Analog HD cameras. It stores footage on a hard disk and allows playback, recording, backup, and remote monitoring through mobile applications.

7. NVR (Network Video Recorder)

An NVR records video from IP cameras through a network. It offers better image quality, supports advanced features, and is commonly used in modern surveillance systems.

8. Hard Disk (HDD)

The hard disk stores recorded CCTV footage. Storage capacity depends on the number of cameras, recording quality, frame rate, and recording duration.

9. SMPS (Power Supply Unit)

The SMPS converts AC power into regulated DC power required for CCTV cameras and other electronic security devices, ensuring stable system operation.

10. Monitor, Mouse & Accessories

Monitors display live and recorded video, while a mouse is used to operate DVRs and NVRs. Other accessories include camera brackets, junction boxes, adapters, connectors, and mounting hardware.

Practical Session

Students will perform the following practical activities:

- *Identify different types of CCTV cameras.*
- *Compare Dome and Bullet cameras.*
- *Observe PTZ camera movement.*
- *Identify DVR and NVR units.*
- *Install and remove a CCTV hard disk.*
- *Connect a monitor and mouse to a DVR.*
- *Identify SMPS and power adapters.*
- *Learn the function of each CCTV component.*

Notes

After completing this module, learners should be able to:

- **Identify all major CCTV camera types.**
- **Select suitable cameras based on installation requirements.**
- **Differentiate between DVR and NVR systems.**
- **Understand the purpose of SMPS, Hard Disk, Monitor, and accessories.**
- **Recognize the function of each CCTV system component before installation.**

MODULE 3

CCTV Cables, Connectors & Power Supply

Module Objective

The objective of this module is to provide learners with knowledge of the different types of cables, connectors, and power supply systems used in CCTV installations. Students will learn proper cable selection, routing, termination, connector installation, and power distribution techniques to ensure reliable and professional CCTV system performance.

1. Importance of Cabling in CCTV Systems

Cables are the backbone of every CCTV system. Proper cable selection and installation ensure stable video transmission, power supply, and long-term system reliability.

2. Coaxial Cable

Coaxial cable (RG-59/RG-6) is commonly used in Analog HD CCTV systems. It carries video signals from the camera to the DVR while maintaining good signal quality over long distances.

3. CAT5e & CAT6 Network Cable

CAT5e and CAT6 cables are used for IP CCTV systems. These cables transmit data between IP cameras, NVRs, switches, and routers while supporting high-speed network communication.

4. BNC Connector

A BNC connector is used to connect Analog HD cameras to DVRs through coaxial cable. Proper crimping ensures secure connections and clear video signals.

5. RJ45 Connector

RJ45 connectors are fitted on CAT5e/CAT6 cables to connect IP cameras, NVRs, network switches, and routers. Proper wiring follows the T568A or T568B standard.

6. DC Connector & Power Adapter

DC connectors supply power to CCTV cameras. A standard CCTV camera usually operates on 12V DC using a power adapter or centralized SMPS.

7. SMPS (Switched Mode Power Supply)

An SMPS converts AC power into regulated DC power and supplies electricity to multiple CCTV cameras safely and efficiently.

8. PoE (Power over Ethernet)

PoE technology allows both power and data to be transmitted through a single network cable, simplifying IP camera installations and reducing wiring costs.

9. Cable Routing & Cable Management

Proper cable routing protects cables from damage and improves system reliability. Cables should be neatly organized using conduits, cable ties, raceways, or PVC pipes while avoiding electrical interference.

10. Cable Testing & Troubleshooting

Before completing an installation, all cables and connectors should be tested using cable testers or multimeters to identify faults such as loose connections, broken wires, or incorrect terminations.

Practical Session

Students will perform the following practical activities:

- *Identify Coaxial, CAT5e, and CAT6 cables.*
- *Practice BNC connector installation.*
- *Practice RJ45 crimping using a crimping tool.*
- *Connect DC connectors to CCTV cameras.*
- *Connect an SMPS to multiple cameras.*
- *Observe a PoE switch and connect an IP camera.*
- *Route cables using conduits and cable clips.*
- *Test network and coaxial cables using cable testers.*
- *Identify common cable faults and rectify them.*

Notes

After completing this module, learners should be able to:

- **Identify different CCTV cables and connectors.**
- **Select the appropriate cable for Analog and IP CCTV systems.**
- **Install BNC and RJ45 connectors correctly.**
- **Understand the operation of SMPS and PoE technology.**
- **Perform basic cable routing and cable management.**
- **Test cables and identify common wiring faults.**
- **Follow professional wiring practices for safe and reliable CCTV installations.**

MODULE 4

DVR, NVR & IP CCTV System Configuration

Module Objective

The objective of this module is to provide learners with practical knowledge of DVR, NVR, and IP CCTV system configuration. Students will learn how to install storage devices, configure recording settings, connect cameras, set up network connectivity, enable remote monitoring, and perform basic troubleshooting for professional CCTV installations.

1. Introduction to DVR & NVR

A DVR (Digital Video Recorder) records video from Analog HD cameras, while an NVR (Network Video Recorder) records video from IP cameras over a network. Both devices allow recording, playback, backup, and remote monitoring.

2. DVR & NVR Ports and Connections

A DVR/NVR contains ports such as Video Input, HDMI, VGA, LAN, USB, Audio, and Power Input. Understanding each port helps in proper installation and system connectivity.

3. Hard Disk Installation

A surveillance hard disk is installed inside the DVR or NVR to store recorded footage. Proper mounting and SATA cable connections ensure smooth recording and long-term storage.

4. Camera Configuration

After connecting cameras to the DVR or NVR, each camera should be detected, named, tested, and positioned correctly to ensure clear monitoring and recording.

5. Recording Settings

Recording can be configured as Continuous Recording, Motion Detection Recording, or Scheduled Recording. Users can also adjust recording quality, frame rate, and storage duration.

6. Date, Time & User Management

Correct date and time settings are important for recorded evidence. User accounts and passwords should be configured to provide secure access to the CCTV system.

7. Network Configuration

The DVR/NVR is connected to a router using a LAN cable to enable internet access, remote viewing, and mobile connectivity.

8. Mobile Viewing & Remote Monitoring

Modern CCTV systems can be monitored remotely using mobile applications by scanning a QR code or entering the device serial number after internet configuration.

9. Video Backup & Playback

Recorded footage can be searched by date and time and backed up to a USB drive for investigation, reporting, or future reference.

10. Basic Troubleshooting

Common problems include “No Video,” “No Hard Disk,” “Camera Offline,” “Network Error,” or “No Remote Access.” These issues can usually be resolved by checking power, cables, settings, and network connectivity.

Practical Session

Students will perform the following practical activities:

Identify all DVR and NVR ports.

Install a surveillance hard disk inside a DVR.

Connect Analog and IP cameras.

Configure camera names and display settings.

Set recording mode (Continuous, Motion & Schedule).

Configure date, time, and user password.

Connect DVR/NVR to a router.

Configure mobile application for remote viewing.

Backup recorded footage to a USB drive.

Troubleshoot common DVR/NVR faults.

Notes

After completing this module, learners should be able to:

- Differentiate between DVR and NVR systems.
- Identify DVR/NVR ports and their functions.
- Install and configure surveillance hard disks.
- Configure cameras and recording settings.
- Set date, time, passwords, and user accounts.
- Connect DVR/NVR to a network for remote monitoring.
- Configure mobile viewing applications.
- Backup CCTV footage safely.
- Diagnose and resolve basic DVR/NVR issues.
- Perform complete system testing before project handover.

MODULE 5

CCTV Installation

Module Objective

The objective of this module is to provide learners with hands-on experience in installing a complete CCTV surveillance system. Students will learn how to conduct a site survey, select camera locations, mount cameras, route cables, connect all components, configure the system, and test the installation according to industry standards.

1. Site Survey & Planning

A site survey is the first step before installation. The technician inspects the premises, identifies security risks, decides camera locations, measures cable routes, and prepares a material list.

2. Camera Location Selection

Cameras should be installed to cover entry and exit points, parking areas, corridors, reception areas, cash counters, warehouses, and other important locations while avoiding blind spots.

3. Camera Mounting Techniques

Proper mounting ensures stable camera performance. Cameras should be fixed securely using appropriate brackets, screws, wall plugs, and junction boxes while protecting them from vibration and weather conditions.

4. Cable Routing & Wiring

Cables should be routed neatly through PVC conduits, casing-capping, raceways, or flexible pipes. Proper cable management improves safety, appearance, and long-term system reliability.

5. Camera Connections

RConnect cameras to the DVR or NVR using the appropriate cables and connectors. Ensure proper power supply, secure terminations, and correct labeling of all cables.

6. Power Supply Installation

Connect the SMPS or power adapters safely to provide stable power to all cameras. Verify voltage levels before switching on the system.

7. System Testing

After installation, check every camera for image clarity, recording, playback, night vision, motion detection, and remote viewing to ensure proper operation.

8. Camera Angle Adjustment

Adjust the camera direction, tilt, and focus to eliminate blind spots and achieve maximum coverage of the surveillance area.

9. Installation Standards & Safety

Follow electrical safety procedures, use proper tools, label cables, secure all wiring, and maintain a clean installation to meet professional standards.

10. Final Handover to Customer

Demonstrate the CCTV system to the customer, explain basic operation, remote viewing, playback, backup procedures, and provide maintenance recommendations.

Practical Session

Students will perform the following practical activities:

- Conduct a basic site survey.
- Prepare a CCTV installation plan.
- Mark camera installation points.
- Mount Dome and Bullet cameras.
- Route and secure CCTV cables.
- Install BNC and RJ45 connectors.
- Connect cameras to DVR/NVR.
- Connect SMPS and power supplies.
- Configure recording and camera settings.
- Adjust camera angles and focus.
- Test live view, recording, playback, and mobile viewing.
- Complete a full CCTV installation project.

Notes

After completing this module, learners should be able to:

- Conduct a professional CCTV site survey.
- Select suitable camera locations for different environments.
- Mount CCTV cameras securely.
- Perform proper cable routing and cable management.
- Connect cameras, DVR/NVR, and power supplies correctly.
- Configure and test the complete CCTV system.
- Adjust camera angles for maximum surveillance coverage.
- Follow industry-standard installation and safety practices.
- Demonstrate system operation to customers.
- Independently complete a basic CCTV installation project.

MODULE 6

CCTV Configuration & Mobile Monitoring

Module Objective

The objective of this module is to teach learners how to configure CCTV systems for efficient operation and remote monitoring. Students will learn to configure DVR/NVR settings, connect the system to the internet, set up mobile applications, manage users, perform video backup, and understand basic network settings for remote access.

DVR & NVR Initial Setup

After installation, the DVR or NVR must be configured by setting the language, date, time, video format, passwords, and storage options before the system is ready for use.

2. Camera Configuration

Each connected camera can be renamed, enabled or disabled, and adjusted for brightness, contrast, resolution, frame rate, and image quality for better surveillance.

3. Recording Configuration

Recording settings allow users to choose Continuous Recording, Motion Detection Recording, or Scheduled Recording based on security requirements and available storage.

4. Network Configuration

The DVR/NVR is connected to a router using a LAN cable. Proper IP address, gateway, DNS, and network settings enable internet access and remote monitoring.

5. Mobile App Configuration

Most modern CCTV systems support mobile applications that allow users to view live video, playback recordings, receive alerts, and monitor cameras from anywhere using an internet connection.

6. User Management & Password Security

Different users can be assigned different access levels such as Administrator, Operator, or Viewer. Strong passwords help prevent unauthorized access to the CCTV system.

7. Video Playback & Backup

Recorded footage can be searched by date, time, or camera. Important videos can be exported to a USB drive for future reference or investigation.

8. Storage Management

Storage settings help manage hard disk space by enabling overwrite recording, checking HDD health, and monitoring available storage capacity.

9. Firmware Update & System Maintenance

Updating DVR/NVR firmware improves security, system performance, and compatibility. Regular maintenance keeps the surveillance system running efficiently.

10. Basic Network Troubleshooting

Common issues such as “No Internet,” “Device Offline,” or “Unable to Connect” can often be solved by checking network cables, router settings, IP configuration, and internet connectivity.

Practical Session

Students will perform the following practical activities:

- Configure DVR/NVR basic settings.
- Rename connected cameras.
- Set recording modes.
- Configure date and time.
- Connect DVR/NVR to a router.
- Configure network settings.
- Install and configure the mobile application.
- Scan QR code for remote viewing.
- View live cameras on a smartphone.
- Playback and backup recorded footage.
- Create additional user accounts.
- Perform basic troubleshooting.

Notes

After completing this module, learners should be able to:

- **Configure DVR and NVR systems independently.**
- **Configure recording and storage settings.**
- **Connect CCTV systems to a local network and the internet.**
- **Set up mobile applications for remote monitoring.**
- **Manage user accounts and passwords securely.**
- **Search, playback, and back up recorded footage.**
- **Perform firmware updates and routine maintenance.**
- **Troubleshoot common network and remote access issues.**
- **Deliver a fully configured CCTV system to the customer with confidence.**

MODULE 7

Access Control & Biometric Systems

Module Objective

The objective of this module is to introduce learners to Access Control and Biometric Systems used in residential, commercial, industrial, and institutional environments. Students will learn the working principles, components, installation procedures, wiring, configuration, and troubleshooting of access control and biometric attendance systems.

1. Introduction to Access Control Systems

An Access Control System is an electronic security solution that allows only authorized persons to enter restricted areas. It improves security by controlling and monitoring entry and exit.

2. Types of Access Control Systems

Access Control Systems can operate using RFID Cards, PIN Codes, Fingerprints, Face Recognition, Mobile Applications, or a combination of these methods depending on security requirements.

3. Biometric Attendance Systems

Biometric systems identify users through fingerprints, facial recognition, palm recognition, or iris scanning. These systems are widely used for attendance management and access control.

4. Main Components of an Access Control System

A basic access control system consists of an Access Controller, RFID Reader or Biometric Device, Electromagnetic Lock (EM Lock), Exit Button, Door Sensor, Power Supply, and Communication Cable.

5. Electromagnetic Lock (EM Lock)

An EM Lock uses magnetic force to lock a door securely. When power is supplied, the magnet holds the armature plate tightly. When power is removed or an exit command is given, the door unlocks.

6. Electric Strike Lock & Exit Button

Electric Strike Locks are installed inside the door frame and release the door when access is granted. Exit buttons allow people to safely unlock the door from inside the premises.

7. Wiring & Installation

Correct wiring between the controller, reader, lock, exit button, power supply, and door sensor is essential for reliable operation. Proper cable routing and labeling simplify maintenance.

8. User Registration & System Configuration

Users are enrolled by registering fingerprints, RFID cards, PIN codes, or facial data. Access permissions, schedules, and attendance settings are then configured.

9. Attendance Reports & Access Logs

Biometric systems automatically generate attendance records and access logs that can be viewed, exported, or integrated with attendance and payroll software.

10. Maintenance & Troubleshooting

Regular maintenance includes cleaning biometric sensors, checking wiring, testing locks, verifying power supply, and resolving issues such as failed authentication, communication errors, or door lock failures.

Practical Session

Students will perform the following practical activities:

- Identify different Access Control devices.
- Identify Biometric Attendance Machines.
- Install an Electromagnetic (EM) Lock.
- Install an Exit Button.
- Connect an Access Control Power Supply.
- Wire an Access Control System.
- Register fingerprint users.
- Register RFID cards.
- Configure user access permissions.
- Generate attendance reports.
- Test complete door access operation.
- Troubleshoot common Access Control faults.

Notes

After completing this module, learners should be able to:

- **Understand the purpose and applications of Access Control Systems.**
- **Identify different biometric and RFID devices.**
- **Install and wire a basic Access Control System.**
- **Install and test EM Locks and Exit Buttons.**
- **Register users using fingerprint and RFID cards.**
- **Configure user permissions and attendance settings.**
- **Generate attendance reports and access logs.**
- **Diagnose and troubleshoot common Access Control and Biometric System faults.**
- **Perform a complete basic Access Control installation independently.**

MODULE 8

Intruder Alarm System Installation

Module Objective

The objective of this module is to provide learners with the knowledge and practical skills required to install, configure, operate, and maintain Intruder Alarm Systems. Students will understand how alarm systems detect unauthorized entry, how different sensors work, and how to install and test a complete alarm system for residential and commercial applications.

1. Introduction to Intruder Alarm Systems

An Intruder Alarm System is an electronic security system designed to detect unauthorized entry into a building or protected area. When an intrusion is detected, the system activates an alarm to alert the owner or security personnel.

2. Types of Intruder Alarm Systems

Intruder Alarm Systems are available as Wired and Wireless systems. Wired systems provide stable communication through cables, while wireless systems use radio signals for faster and easier installation.

3. Alarm Control Panel

The Alarm Control Panel is the central unit of the system. It receives signals from all sensors, processes alarm conditions, and activates sirens or notifications when an intrusion is detected.

4. PIR Motion Sensor

A Passive Infrared (PIR) Sensor detects body heat and movement within its detection range. It is one of the most commonly used sensors for indoor security applications.

5. Magnetic Door & Window Sensor

Magnetic Contact Sensors are installed on doors and windows. The alarm is triggered when the magnetic contact is separated due to the opening of a door or window.

6. Siren, Keypad & Power Supply

The siren provides an audible warning during an alarm event. The keypad is used to arm and disarm the system, while the power supply and backup battery ensure continuous operation during power failures.

7. Wiring & Zone Configuration

Each sensor is connected to a specific zone on the control panel. Proper wiring, labeling, and zone programming help identify the exact location where an alarm is triggered.

8. Arming & Disarming the System

The alarm system can be armed or disarmed using a keypad, PIN code, RFID card, remote control, or mobile application depending on the system model.

9. Testing & Troubleshooting

After installation, every sensor, siren, keypad, and zone should be tested to ensure proper operation. Faults such as sensor failure, low battery, wiring issues, or communication errors should be identified and corrected.

10. Maintenance & Best Practices

Regular inspection, cleaning of sensors, battery replacement, wiring checks, and periodic testing improve system reliability and ensure continuous protection.

Practical Session

Students will perform the following practical activities:

- Identify all Intruder Alarm System components.
- Install an Alarm Control Panel.
- Install a PIR Motion Sensor.
- Install Magnetic Door Sensors.
- Connect an External Siren.
- Install and connect the Keypad.
- Wire sensors to alarm zones.
- Configure alarm zones.
- Arm and disarm the alarm system.
- Test PIR sensors and magnetic contacts.
- Trigger alarm conditions.
- Troubleshoot common alarm system faults.

Notes

After completing this module, learners should be able to:

- Explain the purpose and operation of Intruder Alarm Systems.
- Identify the major components of an alarm system.
- Install and wire PIR Motion Sensors and Magnetic Contact Sensors.
- Connect and configure the Alarm Control Panel.
- Install sirens, keypads, and backup batteries.
- Configure alarm zones correctly.
- Arm and disarm the system safely.
- Test the complete alarm system for proper operation.
- Diagnose and resolve common alarm system faults.
- Perform a basic Intruder Alarm System installation independently.

MODULE 9

System Maintenance, Troubleshooting & Final Practical Project

Module Objective

The objective of this module is to develop the learner's ability to maintain, troubleshoot, repair, and inspect CCTV and Electronic Security Systems. Students will learn preventive maintenance, fault diagnosis, customer support, documentation, and complete a real-world installation project independently.

1. Preventive Maintenance of CCTV Systems

Regular maintenance improves the performance and lifespan of CCTV systems. It includes cleaning cameras, checking cables, inspecting connectors, verifying power supplies, and testing recording functions.

2. Routine Inspection Checklist

A technician should inspect cameras, DVR/NVR, hard disk, power supply, network cables, camera brackets, recording status, storage capacity, and remote viewing to ensure everything is functioning properly.

3. Common CCTV System Faults

Common faults include No Video Signal, Camera Offline, Poor Image Quality, Recording Failure, Hard Disk Error, No Power, Network Failure, and Remote Viewing Issues.

4. Fault Diagnosis & Troubleshooting

Troubleshooting involves identifying the source of the problem by checking power supply, cables, connectors, network settings, camera status, DVR/NVR configuration, and hardware connections.

5. Maintenance of Access Control & Biometric Systems

Regular maintenance includes cleaning fingerprint sensors, checking RFID readers, testing EM Locks, inspecting exit buttons, verifying power supplies, and updating user records when required.

6. Maintenance of Intruder Alarm Systems

Alarm systems should be tested periodically by checking PIR sensors, magnetic contacts, sirens, batteries, alarm panels, and communication between all connected devices.

7. Customer Service & AMC (Annual Maintenance Contract)

Professional technicians should provide customer support, explain system operation, maintain service records, and offer AMC services for periodic inspection and preventive maintenance.

8. Installation Documentation

Proper documentation includes installation reports, cable layouts, device lists, user information, passwords (where permitted), maintenance records, and customer handover documents.

9. Final Project Installation

Students will independently install and configure a complete CCTV and Electronic Security System, including camera installation, wiring, DVR/NVR configuration, mobile monitoring, and system testing.

10. Industry Best Practices & Career Guidance

Professional technicians should follow safety standards, maintain neat workmanship, use quality materials, communicate professionally with customers, and continuously upgrade their technical knowledge to stay competitive in the security industry.

Practical Session

Students will perform the following practical activities:

- Clean and inspect CCTV cameras.
- Check power supplies and cable connections.
- Diagnose common CCTV faults.
- Replace faulty connectors.
- Test DVR/NVR recording and playback.
- Verify mobile monitoring functionality.
- Perform preventive maintenance on biometric and access control systems.
- Test an Intruder Alarm System.
- Complete a full CCTV installation from start to finish.
- Demonstrate the system to the trainer/customer.
- Prepare an installation and maintenance report.

Notes

After completing this module, learners should be able to:

- Perform preventive maintenance on CCTV and security systems.
- Identify and troubleshoot common hardware and software faults.
- Maintain Access Control, Biometric, and Intruder Alarm Systems.
- Complete installation reports and customer handover documentation.
- Deliver professional customer support and AMC services.
- Independently install, configure, test, and maintain complete CCTV & Electronic Security Systems.
- Demonstrate industry-standard installation practices and workplace safety.

Answer Key

Module 1

Q	C
1	A
2	B
3	D
4	B
5	D
6	B
7	D
8	B
9	A
10	B

Module 2

Q	A
1	B
2	B
3	B
4	B
5	B
6	B
7	B
8	C
9	B
10	B

Module 3

Q	A
1	C
2	B
3	C
4	A
5	C
6	B
7	A
8	B
9	B
10	C

Module 4

Q	A
1	B
2	B
3	B
4	B
5	B
6	A
7	A
8	B
9	A
10	B

Module 5

Q	A
1	B
2	D
3	B
4	B
5	A
6	B
7	B
8	D
9	D
10	D

Module 6

Q	A
1	A
2	B
3	A
4	B
5	A
6	B
7	A
8	A
9	A
10	A

Module 7

Q	A
1	B
2	B
3	A
4	B
5	B
6	B
7	A
8	A
9	A
10	D

Module 8

Q	A
1	B
2	A
3	A
4	B
5	A
6	B
7	B
8	B
9	A
10	B

Module 9

Q	A
1	B
2	D
3	A
4	B
5	A
6	A
7	D
8	A
9	A
10	A