

CCTV INSTALLATION TECHNICIAN

CURRICULUM / SYLLABUS

This course encompasses 4 out of 4 National Occupational Standards (NOS) of “CCTV INSTALLATION Technician” Qualification Pack issued by “Electronic Sector Skill Council”.

Program Name	CCTV INSTALLATION Technician		
Qualification Pack Name & Reference ID.	ELE/Q4605 VERSION 1.0		
Version No.	1.0	Version Update Date	12-May-2017
Pre-requisites to Training	10 th Standard Pass		
Training Outcomes	<p>After completing this programme, participants will be able to:</p> <ul style="list-style-type: none"> • Interact with the customer in order to identify and understand their requirements. • Ensure customer satisfaction • Install and Repair dysfunctional system. • Identify dysfunctional components through visual inspection and by use of multimeter • To understand CCTV camera installation requirement in terms of equipment, system, tools, applications appropriate for a particular site. • Select Suitable cameras & DVR to provide the better solution to the customers. • Read and Comprehend signs, labels and warning • Communicate effectively • Follow behaviour etiquettes while interacting with others • Establishing good working relationships with colleagues within and outside the department by coordinating 		

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p>Basics of Security Surveillance</p> <p>Theory Duration (hh:mm) 16 :00</p> <p>Practical Duration (hh:mm) 16 :00</p> <p>Corresponding NOS Code ELE/N4611</p>	<p>Understand the surveillance system.</p> <ul style="list-style-type: none"> • Knowledge of pro's & con's of surveillance. • Explain the facts of video surveillance • Explain and construct various nodes of CCTV surveillance system 	<ul style="list-style-type: none"> •
2	<p>Functions of Video Surveillance</p> <p>Theory Duration (hh:mm) 16 :00</p> <p>Practical Duration (hh:mm) 16 :00</p> <p>Corresponding NOS Code ELE/N4611</p>	<ul style="list-style-type: none"> • Constructing of a video surveillance system. • Explain function of blocks and equipment required to implement a video surveillance system. • Understanding the facts about CCTV and its interfacing devices 	<ul style="list-style-type: none"> • Camera. • DVR. • Cables • Adapter • Display device.
3	<p>Types of Cameras and their functions</p> <p>Theory Duration (hh:mm) 16 :00</p> <p>Practical Duration (hh:mm) 16 :00</p> <p>Corresponding NOS Code ELE/N4611</p>	<ul style="list-style-type: none"> • Understanding the various types of camera and their functionality. • Reassembling the camera & exam the parts of camera to understand their mechanism. • Selecting suitable camera after understanding 	<ul style="list-style-type: none"> • Camera(diff. types). <ol style="list-style-type: none"> *CCTV cameras Analog Camera HD Camera IP Cameras Dome bullet IR IR array Vandal Proof Vari-focal Box camera Wifi camera PTZ • DVR. • Cable • Screw driver set • Display.
4	<p>Sensors, Light, Lens(and selection) and About Zoom</p> <p>Theory Duration (hh:mm)</p>	<ul style="list-style-type: none"> • Different types of lens and their utility. • Differentiate & select the best camera from the same group depending on the image quality being measured by TVL chart. 	<ul style="list-style-type: none"> • Lenses(diff. types). • Screw driver set • Camera • DVR

	<p>16 :00 Practical Duration (hh:mm) 16 :00</p> <p>Corresponding NOS Code ELE/N4610</p>	<ul style="list-style-type: none"> • Selecting a camera for higher security application. • About Illumination & it's functionality • Different types of zoom technologies & their utility to get a better output in surveillance. • Angle of view settings • Selecting the proper lenses will give you a quality output. 	
5	<p>DVR and Switcher</p> <p>Theory Duration (hh:mm) 17:00</p> <p>Practical Duration (hh:mm) 17 :00</p> <p>Corresponding NOS Code ELE/N4611</p>	<ul style="list-style-type: none"> • DVR as interface to view and record the image transmitted by a camera. • Explain the function of various blocks of DVR. • Understand the recording format of a DVR. • Enabling and disabling the features of a DVR depending on the level of surveillance and customer requirement. • Sequential switcher Matrix switcher • Automatic Sequential Switcher switches the images at specified intervals. 	<ul style="list-style-type: none"> • Customer Application Form • Feedback Form • Packages Form • Props depending on Activity • Videos • Powerpoint • Laptop • Projector • Projector Screen • White Board • Marker
6	<p>Principles of Network Remote Accessing</p> <p>Theory Duration (hh:mm) 17 :00</p> <p>Practical Duration (hh:mm) 17 :00</p> <p>Corresponding NOS Code ELE/N4611 ELE/N4610 ELE/N4609</p>	<ul style="list-style-type: none"> • Explain the nodes for remote access of a CCTV camera / DVR • Configuring the DVR with Different type of router configuration <ul style="list-style-type: none"> ○ Connection setup ○ Confirming the Connection. ○ Connecting DVR to the router ○ Port Forwarding guide by router ○ Eg. D-Link, Net gear , Linksys • DVR DDNS Configuration 	<ul style="list-style-type: none"> • DVR. • Camera • Cable • LAN connection/Modem. • Laptop • Display
7	<p>Install the CCTV Camera</p> <p>Theory Duration (hh:mm) 17 :00</p> <p>Practical Duration (hh:mm) 17 :00</p> <p>Corresponding NOS Code ELE/N4610</p>	<ul style="list-style-type: none"> • To understand the warranty associated with the hardware product • To know related documents for the hardware equipments • To know company's policy on product's warranty and other terms and conditions • To know company's customer support and service policy • To know camera specifications such as focus, lens type, zoom • To check the hardware equipments before taking to the installation site • To replace the hardware if there is any issue or malfunction is found while testing 	<ul style="list-style-type: none"> • Practical Lab <ol style="list-style-type: none"> a. Computer b. LCD display c. White board d. Marker e. Tool Kit for installing camera f. Installation manual g. Safety precaution manual h. Hardware equipment • Cables <ol style="list-style-type: none"> a. co-axial(3+1 cable) b. twisted pair (CAT 6) c. Routers d. Switchers • connectors <ol style="list-style-type: none"> a. BNC

	<ul style="list-style-type: none"> • To Know different types of electronic surveillance products and functionalities • To read the standard operating procedures for different equipment • To Know elements of CCTV systems such as camera, DVR, monitor • To check for critical equipment such as camera, recorder w.r.t quality and output • To ensure all the tools, equipments, utilities are available in good to enable installing in single visit • To know specification and the procedures to be followed for setting up the system • To know functions of electrical and mechanical parts or modules • To know power requirement of different CCTV related equipment • To use BNC connectors for joining cables and crimp them • To connect all the cables from multiple cameras to the CCTV system area • To know installation procedures given in the manuals• To use power cable of specified thickness to connect CCTV system with power supply • To know basic electronics involved in the hardware • To know voltage and power requirement for different hardware devices • To know voltage requirement and other specification on CCTV hardware • To mount the CCTV camera so as to cover maximum area • To decide whether the camera requires any enclosure to protect from dust, vandalism and climatic conditions • To know camera specifications such as focus, lens type, zoom • To know controls of different options in camera such as rotation, speed of movement in pan / tilt camera • To use stable mounting structure and ensure that is not disturbed by wind or rain which would affect the video quality • To decide on the height of camera installation according to the end purpose (for example: if the visitor entering the premise is to be 	<ul style="list-style-type: none"> b. Power pin c. RJ-45 jacks
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		<p>monitored, camera should not be placed too high and their face would not be captured)</p> <ul style="list-style-type: none"> • To set up the type of camera such as pan, tilt, zoom unit as per customer requirement • To set camera controls • To connect the power and video output cable to the camera • To use tools such as diagonal cutters, screwdrivers, crimp tools, knife for cabling and camera mounting • To use recommended tools for specific equipment to avoid damage • To know functions of electrical and mechanical parts or modules • To know how to operate the system and other hardware • To follow standard operating procedure of tools and equipments and avoid any hazard • To follow the installation manual for specific hardware product • To follow standard safety procedures while installing • To know installation procedures given in the manuals • To operate hardware equipment in CCTV system • To Know safety rules, policies and procedures –To Know quality standards to be followed • To use other specific devices for installation of camera • To improve work processes • To ensure that only quality hardware products are procured complying to industry and quality standards • To ensure product installation and user manual is available which should be given to the user or customer • To ensure that there are no cable joins, sharp bends during cabling • To ensure weather proof (UV proof) cable are used in outdoors • To ensure that cabling is sturdy, protected and does not disturb the ambience of building • To ensure that cameras are protected from light while installing in outdoor • To ensure the intended area is covered during movement in case of tilt or pan type of camera • To assess power requirement of camera and use required power 	
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		<p>supply and cable</p> <ul style="list-style-type: none"> • To educate customer on use of cameras for desired monitoring and warranty period and annual maintenance requirement • To ensure zero material damage while handling the equipment during installation process • To install target number of CCTVs as per company's policy • To know company's sales and after sales support policy • To know company's policy on product's warranty and other terms and conditions • To know company's customer support and service policy • To know importance of the individual's role in the workflow • To know company's policies on: incentives, delivery standards, and personnel management • To share work load as required • To achieve the targets given on installations • To reduce repetition of errors 	
8	<p>Setup the CCTV Surveillance system</p> <p>Theory Duration (hh:mm) 17 :00</p> <p>Practical Duration (hh:mm) 17 :00</p> <p>Corresponding NOS Code ELE/N4611</p>	<ul style="list-style-type: none"> • To procure and place the Digital Video Recorder (DVR) in an appropriate place as per customer's requirement • To connect all the cameras installed to the DVR • To ensure that all cameras are connected to the DVR and the wiring is appropriate • To connect the monitor (TV / PC) with the video output connection in the DVR • To connect speakers, if required, for audio output to DVR • To connect the camera optional controls (tilt / pan / zoom) to DVR • To use DVR link option to connect with other DVR in the network • To connect the DVR to router, if required, to enable remote monitoring • To connect the power supply of DVR, monitor, speakers to set up the system • To install the appropriate software for IP network or remote monitoring • To enter the appropriate IP address to receive the video signals through IP network / internet • To connect all equipments and switch on to start the video capture 	<ul style="list-style-type: none"> • Practical Lab <ol style="list-style-type: none"> a. Computer b. LCD display c. White board d. Marker e. Tool Kit for installing camera f. Installation manual g. Safety precaution manual h. Hardware equipment • Cables <ol style="list-style-type: none"> a. co-axial(3+1 cable) b. twisted pair (CAT 6) c. Routers d. Switchers • Connectors <ol style="list-style-type: none"> a. BNC b. Power pin c. RJ-45 jacks • CCTV cameras <ol style="list-style-type: none"> a. Analog Camera b. HD Camera c. IP Cameras d. Dome e. Bullet f. IR g. IR array h. Vandal Proof i. Vari-focal j. Box camera k. Wifi camera

			<ul style="list-style-type: none"> I. PTZ • DVR and NVR <ul style="list-style-type: none"> a. 4 channel b. 8 channel c. 16 channel • DVR cards.
9	<p>Cables</p> <p>Theory Duration (hh:mm) 16 :00</p> <p>Practical Duration (hh:mm) 16 :00</p> <p>Corresponding NOS Code ELE/N4610 ELE/N9909</p>	<ul style="list-style-type: none"> • Interfacing the camera with the DVR with suitable medium depending on the wishing network / system if any. • Explain and collecting tools required to set up a surveillance system. • Discuss with the other team members and about the required specification of a system. • Help the team member as a good support worker to create and surveillance system and remain quite and patience at the time of installation / fault finding. 	<ul style="list-style-type: none"> • Cables <ul style="list-style-type: none"> a. Coaxial b. Fiber Optic c. Cat 5 d. Crimper e. Connectors f. Cutters • Cables <ul style="list-style-type: none"> a. co-axial(3+1 cable) b. twisted pair (CAT 6) c. Routers d. Switchers • Connectors <ul style="list-style-type: none"> a. BNC b. Power pin c. RJ-45 jacks • CCTV cameras <ul style="list-style-type: none"> a. Analog Camera b. HD Camera c. IP Cameras d. Dome e. Bullet f. IR g. IR array h. Vandal Proof i. Vari-focal j. Box camera k. Wifi camera l. PTZ • DVR and NVR <ul style="list-style-type: none"> a. 4 channel b. 8 channel c. 16 channel DVR cards.
10	<p>Survey, planning and maintenance</p> <p>Theory Duration (hh:mm) 16 :00</p> <p>Practical Duration (hh:mm) 16 :00</p> <p>Corresponding NOS Code ELE/N4609 ELE/N4610</p>	<ul style="list-style-type: none"> • Making a good site survey and identifying the location of the camera to be fixed. • Selecting the suitable camera depending on the coverage area required by the customer. • Help & co-operate with the team members while taking measurement of the site. • Interfacing & connecting the camera and synchronizing it with control room. • To make understand the recording & retrieving process of previously recorded footage to the controller of 	<ul style="list-style-type: none"> • Connectors <ul style="list-style-type: none"> a. BNC b. Power pin c. RJ-45 jacks • CCTV cameras <ul style="list-style-type: none"> a. Analog Camera b. HD Camera c. IP Cameras d. Dome e. Bullet f. IR g. IR array h. Vandal Proof i. Vari-focal j. Box camera

	ELE/N9909	<p>the system.</p> <ul style="list-style-type: none"> Convince the customer about the best available camera for better surveillance. 	<ul style="list-style-type: none"> k. Wifi camera l. PTZ • DVR and NVR <ul style="list-style-type: none"> a. 4 channel b. 8 channel c. 16 channel • DVR cards • DVR(Diff. Types) • Camera(Diff. Types). • Adapter • Cable(Diff. Types). • Screw driver • Display
11	<p>Interaction with customers and colleagues, concept of team work</p> <p>Theory Duration (hh:mm) 16 :00</p> <p>Practical Duration (hh:mm) 16:00</p> <p>Corresponding NOS Code ELE/N4609 ELE/N9909</p>	<ul style="list-style-type: none"> Understand the basic requirements of the customer. <ul style="list-style-type: none"> Help them to choose the best solution. Continuous interaction with the customer for any installation or post installation maintenance 	<ul style="list-style-type: none"> • Projector • Laptop
	<p>Total Duration</p> <p>Theory Duration 180:00</p> <p>Practical Duration 180:00</p>	<p>Unique Equipment Required:</p> <ul style="list-style-type: none"> • Allen Key Set • Cable (RJ-6 video cable) • Cable (2 core power cable) • Cable (CAT-5) • CCTV Camera IR Dome (Analog) • CCTV Camera IR Bullet with IP66 • CCTV Camera Box Camera with Outside housing • CCTV Camera IP Camera - Dome • CCTV Camera vandal proof camera • Crimping Tool • Wire Cutter • Digital Multimeter • Digital Video Recorder 4 Channel and 8 channel • hard disk purple color - video surveillance hard disk • Nose Pliers • Hammer • Paper cutter/knife • Insulation Tape • Electrical Drill • Drill bit Set • Electrician Plier • ESD Gloves 	

		<ul style="list-style-type: none"> • LCD Monitor (minimum 15 inch required) • Line Tester • Screw Driver Set • Wire Stripper • Safety Shoes • Safety Gloves • Safety Helmet • Cable cat-5 • Connectors (vga connectors) • DC Connector (for power cables) • LAN Tester (for crimping of RJ 45 connectors1) • 8-port switch • PC (for the configuration of DVR)
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Grand Total Course Duration: **360 Hours 00 Minutes**

(This syllabus/ curriculum has been approved [Electronics Sector Skills Council of India](#))