

Subject Code	Subject Name	Period per Week		Credit
28565	SURVEILLANCE SECURITY SYSTEM	T	P	C
		1	3	2

Rationale	The surveillance security systems enhance students' knowledge, skills, and readiness for careers in industries where security is paramount. It also aligns with the growing demand for professionals capable of designing and managing modern surveillance solutions. Students can design a system to monitor, record, and analyze activities within a given area to enhance safety, prevent crime, and provide evidence in case of incidents. The system employs various sensors such as cameras, motion detectors, door/window sensors, and glass-break detectors, Types of Lens & their functions, DVR, NVR interface, Principles of remote access, networking basic.
Learning Outcome (Theoretical)	After Completing the subject, students will be able to: <ol style="list-style-type: none"> 1. Interpret surveillance security System. 2. Explain Cameras, Lens and sensors. 3. Illustrate DVR, NVR interface and Remote access. 4. Analyze Video Signal and Control Signal Transmission 5. Elucidate Computer Networking 6. Illustrate installation of Surveillance system 7. Design and develop a surveillance security System
Learning Outcome (Practical)	<ol style="list-style-type: none"> 1. Identify Surveillance system requirements of a client aspect. 2. Prepare an installation plan through visual inspection 3. Identify proper components, equipment & tools. 4. Select Suitable cameras & DVR/NVR to the customer's requirements 5. Select an area to install necessary electrical & data cable warnings. 6. Install and Configure access control device and software. 7. Maintain working environment.

Detailed Syllabus (Theory)

Unit	Topics with contents	Class (1 Period)	Final Marks
1	Surveillance security System 1.1 Define surveillance system. 1.2 State different types of surveillance. 1.3 Describe problems & constrains of surveillance. 1.4 State the uses of access control in Surveillance systems.	2	5
2	Video surveillance 2.1 Define video surveillance. 2.2 Illustrate the Construction procedure of a video surveillance system. 2.3 State the function of video surveillance. 2.4 Explain the essential components of the CCTV camera system 2.5 Explain construction procedure of various nodes and blocks in CCTV surveillance system 2.6 Explain Security policy model.	4	5
3	Cameras, Lens and sensors 3.1 Define pixels, camera, Lens and Sensor. 3.2 Describe the function of different types of cameras. 3.3 List different types of lenses 3.4 State Fixed lenses, Zoom lenses, Varifocal lenses, Monofocal lenses, Wide Angle lenses with uses 3.5 State various types of CCTV drawing Symbols.	2	5
4	DVR, NVR interface and Remote access 4.1 Define DVR and NVR. 4.2 Describe the function of various blocks of DVR and NVR. 4.3 State the uses of physical storage and cloud storage. 4.4 Describe the recording format of a DVR and NVR. 4.5 Define remote access system. 4.6 Mention the Advantage and disadvantage of remote access system.	4	8
5	Surveillance system installation 5.1 List the necessary equipment of Surveillance system. 5.2 State the various type of cables uses in surveillance system 5.3 Describe the function and operation of Biometric device, Intercom, Door lock, Emergency Alarm 5.4 Illustrate the installation process of Biometric system. 5.5 Describe the maintenance procedure of Surveillance system.	4	7
	TOTAL	16	30

Detailed Syllabus (Practical)

SL.	EXPERIMENT NAME	Class (3 Period)	Marks (Continuous)
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1.	Requirements, Quotation and approval. 1.1 Collect requirements from Client. 1.2 Select products as per requirement. 1.3 Prepare Budget as per requirements. 1.4 Prepare design and diagram 1.5 Prepare a quotation as per requirements. 1.6 Approve quotation from client. 1.7 Maintain the record of performed task.	2	5
2.	Testing equipment's and set up. 2.1 Follow Occupational safety and health (OSH) practices. 2.2 Collect the necessary equipment's and select BNC or Video balun, Power Adapter, Cable, Camera, DVR and NVR. 2.3 Connect and set up equipment's according to diagram. 2.4 Test the equipment's. 2.5 Identify and Isolate the faulty device. 2.6 Maintain the record of performed task.	1	5
3.	Perform Wiring of Power and Network Cable. 3.1 Follow Occupational safety and health (OSH) practices. 3.2 Identify the power source. 3.3 Perform wiring as per required. 3.4 Install power equipment. 3.5 Connect cable according to diagram. 3.6 Connect different network equipment. 3.7 Maintain the record of performed task.	2	5
4.	Install the CCTV camera. 4.1 Follow Occupational safety and health (OSH) practices. 4.2 Make survey and identify the location of the camera to be fixed. 4.3 Select the suitable camera depending on the coverage area required by the customer. 4.4 Connect power equipment of different CCTV Camera. 4.5 Select cable and connector (coaxial/twisted pair cable and BNC connectors/ Video Balun). 4.6 Connect all the cables and cameras as per procedure. 4.7 Ensure all cable and connectors are connected properly. 4.8 After complete all procedure connect AC/DC Power Adapter with CCTV Camera. 4.9 Maintain the record of performed task.	2	5
5.	Install the IP (and PTZ) camera 5.1 Follow Occupational safety and health (OSH) practices. 5.2 Follow installation procedures as per manuals. 5.3 Mount the IP cameras such as pan, tilt, zoom. 5.4 Connect power equipment/ Use POE switch of IP Cameras. 5.5 Assign IP address. 5.6 Maintain the record of performed task.	1	5
6.	Install and configure DVR/NVR Machine. 6.1 Follow Occupational safety and health (OSH) practices. 6.2 Set up DVR/NVR as per diagram. 6.3 Install Hard disk in DVR/NVR. 6.4 Ensure that all cables and connectors are connect Properly. 6.5 Assign IP Address to connect DVR/NVR. 6.6 Install the appropriate software for remote monitoring. 6.7 Configure the DVR/NVR as per procedure. 6.8 Maintain the record of performed task.	1	5

7.	Configure the camera 7.1 Follow Occupational safety and health (OSH) practices. 7.2 Perform control and configure/settings of camera such rotation, speed of movement in pan/tilt camera 7.3 Use stable mounting structure and ensure that is not disturbance any circumstance. 7.4 Ensure that cameras are protected from light while installing in outdoor. 7.5 Maintain the record of performed task.	2	5
8.	Backup data from DVR/NVR 8.1 Follow Occupational safety and health (OSH) practices. 8.2 Connect external storage device to the DVR/NVR. 8.3 Use Backup Option from the DVR/NVR as per manual. 8.4 Select particular camera for backup the footage. 8.5 Set time and date to find the footage for backup. 8.6 select video format for backup such as dav, mp4, PAL, NTSC. 8.7 Start or Click Backup option. 8.8 Maintain the record of performed task.	1	5
9.	Install and Configure Biometric and software 9.1 Follow Occupational safety and health (OSH) practices. 9.2 Install and configure Biometric device. 9.3 Install and connect Biometric Device Software. 9.4 Enroll employees data in Biometric device 9.5 Configure attendance time table for employee. 9.6 link employees data from devices to software. 9.7 Generate test Report and get output by software. 9.8 Maintain the record of performed task.	2	5
10.	Wireless series camera setup and install 10.1 Follow Occupational safety and health (OSH) practices. 10.2 Select a wireless series camera from a specific company. 10.3 Read and get knowledge the camera mechanism from operational manual 10.4 Select and install SD Card for appropriate place of camera 10.5 Mount the Device with appropriate place and position. 10.6 Connect the camera with a local Wi-Fi follow the instruction Manual. 10.7 Download the necessary software for remotely access. 10.8 Maintain the record of performed task.	2	5
	Total	16	50

NECESSARY RESOURCES (TOOLS, EQUIPMENT AND MACHINERY):

SL	Item Name	Quantity
1	CCTV Camera	04 nos
2	IP Camera	04 nos
3	Digital Video Recorder (DVR)	01 nos
4	Network Video Recorder (NVR)	01 nos
5	BNC/Video Balun	08 nos
6	CAT 5/CAT 6 and Co-axial Cable	04 pair
7	Electric wire	1 box (305M)
8	AC/DC Power adapter	04 nos
9	VGA/HDMI cable	02 nos
10	Network Switch-8 Ports	3/4 nos
11	Hard Disk	02 nos
12	RJ45 Connector	10 nos
13	Router (Wireless)	01 nos

14	Monitor (PC/TV)	01 nos
15	Drill Machine	01 nos
16	Wireless Series Camera	02 nos
17	Pin, Clip, Scraw, Tie, Tape and necessary items	-
18	Power connection	08 nos
19	Wired Mouse	02 nos
20	Internet connection	At least 10 Mbps
21	Time Attendance Access Point Device	01 nos
22	Computer	01 nos
23	Smart phone for remote access	01 nos
24	Safety glubs	40 pair
25	Remote Access Software from specific company (SMART PSS, IVMS, CLOUD SEE ETC)	-
26	Remote Access Application from specific company (DMSS,HIK-CONNECT,CLOUD SEE,V380,IMOU,EZVIZ ETC)	-
27	Others	-

RECOMMENDED BOOKS:

SL	Book Name	Writer Name	Publisher Name & Edition
01.	Digital Video Surveillance and Security	Anthony C. Caputo	Elseiver
02.	Security Engineering	Ross Anderson	Wiley
03.	Closed Circuit Television Third Edition	Joe Cieszynski	Elseiver
03	Digital CCTV	Emily Harwood	Elseiver

WEBSITE REFERENCES:

SL	Web Link	Remarks
1	https://www.dahuasecurity.com/support/training/eLearning	
2	https://en.wikipedia.org/wiki/Surveillance	
3	https://en.wikipedia.org/wiki/Closed-circuit_television	
4	https://en.wikipedia.org/wiki/Dynamic_Host_Configuration_Protocol	
5	https://www.google.com/	
6	https://www.youtube.com/	