

Cyber Security & Internet Security ELC Information Brochure



**Department of Computer Science and Engineering,
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THAPAR INSTITUTE
OF ENGINEERING & TECHNOLOGY
(Deemed to be University)

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Cyber Security and Internet Security ELC Agenda

Cyber Security and Internet Security deals with the design and implementation of “*Smart Remote Monitoring System*”. This activity focuses on student-centered learning and will lead to overall development of an individual. Students will develop a real-time IoT-based Remote Monitoring System with the help of sensors and modules.

Following applications are suggested:

- Design a Smart Home Security System.
- Design a security system to protect the lockers in banks.
- Design an automatic door bell system to ring the bell when a human is detected.
- Design a system which can be used in museums to protect valuable things.
- Design a system which can detect some unpleasant event, for example, flame or gas leakage in industrial buildings.
- Design a theft detection system for shopping malls.
- Design an alert system to identify unusual activities in banks, offices etc.

These are indicative activities only; you are free to explore to go to the next level.

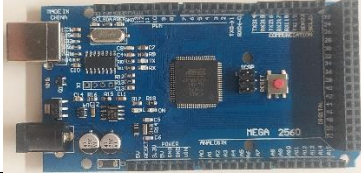


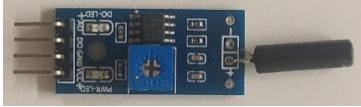
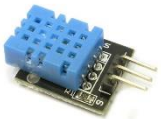

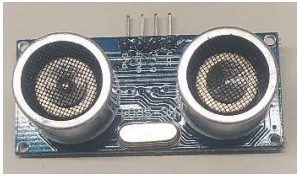
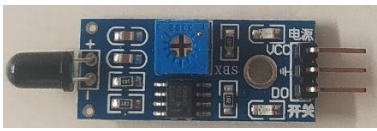
Come up with innovative ideas of utilizing the available hardware in the best possible way for a particular application of your choice.





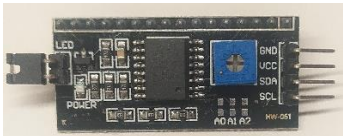



Date: 24th November 2024
(Slot 1 9:00-12:30 pm) and Slot 2 (1:30-4:30 PM)

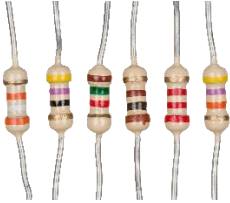
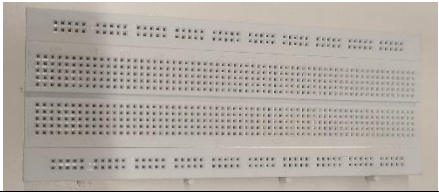


Venue: Activity Space 1 and 2, LT201 and LT202

Detailed description of the Hardware Components

Hardware components are as follows:

S.No	Component		Description
1	Mega Arduino Board		The Arduino MEGA 2560 is an 8-bit board with 54 digital pins, 16 analog inputs, and 4 serial ports.
2	PIR Sensor (Motion Sensor)		PIR sensors allow you to sense motion, almost always used to detect whether a human has moved in or out of the sensor's range.
3	IR Sensor		IR sensors are widely used in motion detectors, which are used in building services to switch on lamps or in alarm systems to detect unwelcome guests.
4	Vibration Sensor		Vibration sensors are piezoelectric accelerometers that sense vibration. They are used for measuring fluctuating accelerations or speeds or for normal vibration measurement.
5	Temperature and Humidity Sensor		They give you a measurement of the temperature and humidity of a place with one device.
6	Fingerprint Sensor		Fingerprint sensor will be used for fingerprint detection and verification.
7	Ultrasonic Sensor		An ultrasonic sensor is an electronic device that measures the distance of a target object by emitting ultrasonic sound waves, and converts the reflected sound into an electrical signal.
8	Flame Sensor		A flame sensor is one kind of detector which is mainly designed for detecting as well as responding to the occurrence of a fire or flame.

9	Smoke Sensor		A smoke detector is a device that senses smoke, typically as an indicator of fire.
10	Buzzer		A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric
11	EM-18 RFID Reader Module		EM18 is a RFID reader which is used to read RFID tags of frequency 125 kHz. After reading tags, it transmits unique ID serially to the PC or microcontroller using UART communication or Wiegand format on respective pins
12	RFID Cards		RFID cards are used for applications where tracking or identifying personnel is important
13	I2C Module		I2C Module has an inbuilt PCF8574 I2C chip that converts I2C serial data to parallel data for the LCD display.
14	LCD Display		LCD (Liquid Crystal Display) is a type of flat panel display.
15	NodeMCU		NodeMCU is a low-cost open source IoT platform. It initially included firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which was based on the ESP-12 module. Later, support for the ESP32 32-bit MCU was added.
16	LEDs		A light-emitting diode (LED) is a semiconductor device that emits light when an electric current is passed through it

16	Resistors and Jumper wires		A resistor is an electrical component that limits or regulates the flow of electrical current in an electronic circuit. Jumper wires are used for making connections between items on your breadboard and Arduino's header pins.
17	Breadboard		A breadboard, solderless breadboard, or terminal array board is a construction base used to build semi-permanent prototypes of electronic circuits
18	Switches		An electronic switch is an electronic component or device that can switch an electrical circuit, interrupting the current or diverting it from one conductor to another.
19	Multimeter		An instrument designed to measure electric current, voltage, and usually resistance, typically over several ranges of value.

Detailed description of Schedule

Slot 1

S. No.	Duration	Tasks
1	9:00-9:30	Issue of Hardware
2	9:30-10:30	Explore Arduino board, i.e., ATMEGA2560, various available sensors and EM-18 RFID Reader, NodeMCU modules. Interfacing of available sensors with the Arduino
3	10:30-11:30	Interfacing of EM-18 RFID Reader and I2C
4	11:30-12:30	Interfacing of NodeMCU Module with Arduino Panel Evaluation and Returning of the hardware

Slot 2

S. No.	Duration	Tasks
2	1:30-2:30	Issue of Hardware, Explore Arduino board, i.e., ATMEGA2560, various available sensors and EM-18 RFID Reader, NodeMCU modules Interfacing of available sensors with the Arduino
3	2:30-3:30	Interfacing of EM-18 RFID Reader and I2C
4	3:30-4:30	Interfacing of NodeMCU Module with Arduino Panel Evaluation and Returning of the hardware

Artifacts to be Submitted

Artifacts to be submitted on LMS portal by 1st Dec, 2024 till 11:59 PM.:

- Report in pdf which comprised of title of project, team member details, objectives, need analysis, working methodology (maximum 2 pages)
- A short video of 4-5 minutes in which all the team members have to participate and show the working prototype of their designed system.

Note: These are to be submitted individually. Group members can submit the same video through their individual accounts on LMS portal but evaluation will be group wise.