

IOT APPLICATIONS OF ELECTRICAL ENGINEERING LAB

Course Code	23SO8651	Year	III	Semester(s)	I
Course Category	Skill Enhancement Course	Branch	EEE	Course Type	Theory
Credits	2	L-T-P	0-1-2	Prerequisites	NIL
Continuous Internal Evaluation:	30	Semester End Evaluation:	70	Total Marks:	100

Course Outcomes	
Upon successful completion of the course, the student will be able to	
CO1	Apply the Arduino Integrated Development Environment with embedded c.(L3)
CO2	Analyze and write Program in embedded Python in Raspberry Pi OS .(L4)
CO3	Analyze various sensors with Arduino/Raspberry Pi in the IoT environment. (L4)
CO4	Analyze different displays with Arduino/Raspberry Pi and Interconnect with wireless communication technologies. (L4)
CO5	Ability to engage in independent study to make an effective presentation and submit a report on various technologies.

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:High, 2: Medium, 1:Low)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3			3								2	2	2
CO2		3		3	2							2	2	2
CO3		3		3	2							2	2	2
CO4		3		3	2							2	2	2
CO5									3	3				

SYLLABUS		
Unit No.	Contents	Mappe d CO
I	Module–1: Programming Arduino: (3 hrs) Arduino - Classification of Arduino Boards - Pin diagrams – Arduino Integrated Development Environment (IDE) – Programming Arduino.	CO1 CO5
II	Module–2: Sensors: (5 hrs) Working of temperature sensor, proximity sensor, IR sensor, Light sensor, ultrasonic sensor, PIR Sensor, Colour sensor, Soil Sensor, Heart Beat Sensor, Fire Alarms etc. Actuators: Stepper Motor, Servo Motor and their integration with Arduino/Raspberry Pi.	CO2 CO3 CO4 CO5
III	Module–3: Raspberry Pi: (2 hrs) Introduction, Classification of Rasperberry Pi Series - Pin diagrams –	CO2 CO3

	Programming Raspberry Pi.	CO4 CO5
IV	Module-4: Display: (2 hrs) Working of LEDs, LED, OLED display, LCDs, Seven Segment Display, Touch Screen etc. Analog Input and Digital Output Converter etc. and their integration with Arduino/Raspberry Pi.	CO2 CO3 CO4 CO5
V	Module-5: Wireless Communication Devices: (4 hrs) Working of Bluetooth, Wi-Fi, Radio Frequency Identification (RFID), GPRS/GSM Technology, ZigBee, etc and their integration with Arduino/Raspberry Pi. Features of Alexa.	CO2 CO3 CO4 CO5

Syllabus		
Exp. No.	Contents	Mapped CO
Any Ten Experiments		
1	Familiarization with Arduino/Raspberry Pi and perform necessary software installation.	CO1,CO2, CO5
2	Interfacing of LED/Buzzer with Arduino/Raspberry Pi and write a program to turn ON LED for 1 sec after every 2 seconds.	CO1,CO2, CO3, CO5
3	Interfacing of Push button/Digital sensor (IR/LDR) with Arduino/Raspberry Pi and write a program to turn ON LED when push button is pressed or at sensor detection.	CO1,CO2, CO3, CO5
4	Interfacing of temperature sensor with Arduino/Raspberry Pi and write a program to print temperature and humidity readings.	CO1,CO2, CO3, CO5
5	Interfacing of Organic Light Emitting Diode (OLED) with Arduino/Raspberry Pi	CO1,CO2, CO3, CO5
6	Interfacing of Bluetooth with Arduino/Raspberry Pi and write a program to send sensor data to smartphone using Bluetooth.	CO1,CO2, CO3, CO5
7	Interfacing of Bluetooth with Arduino/Raspberry Pi and write a program to turn LED ON/OFF when '1'/'0' is received from smartphone using Bluetooth.	CO1,CO2, CO3, CO5
8	Write a program on Arduino/Raspberry Pi to upload and retrieve temperature and humidity data to thingspeak cloud.	CO1,CO2, CO3, CO5
9	Interfacing of 7 Segment Display with Arduino/Raspberry Pi	CO1,CO2, CO4, CO5
10	Interfacing of Joystick with Arduino/Raspberry Pi	CO1,CO2, CO4, CO5
11	Interfacing of Analog Input & Digital Output with Arduino/Raspberry Pi	CO1,CO2, CO4, CO5
12	Night Light Controlled & Monitoring System	CO1,CO2, CO3,CO4, CO5

13	Interfacing of Fire Alarm Using Arduino/Raspberry Pi	CO1,CO2, CO3,CO4, CO5
14	IR Remote Control for Home Appliances	CO1,CO2, CO3,CO4, CO5
15	A Heart Rate Monitoring System	CO1,CO2, CO3,CO4, CO5
16	Alexa based Home Automation System	CO1,CO2, CO4, CO5

Learning Resources	
Students need to refer the following links:	
1. https://aim.gov.in/pdf/equipment-manual-pdf.pdf 2. https://atl.aim.gov.in/ATL-Equipment-Manual/ 3. https://aim.gov.in/pdf/Level-1.pdf 4. https://aim.gov.in/pdf/Level-2.pdf 5. https://aim.gov.in/pdf/Level-3.pdf	