



DHANALAKSHMI SRINIVASAN ENGINEERING COLLEGE

(AUTONOMOUS)

(Approved by AICTE & Affiliated to Anna University, Chennai)

Re-Accredited by NAAC with 'A' Grade

Accredited by NBA for AERO, BME, CSE, ECE, EEE, IT & MECH.

PERAMBALUR-621212, TAMILNADU, INDIA.

Website: www.dsengg.ac.in



LABORATORY COURSE PLAN

COURSE - INFORMATION:

LAB COURSE TITLE	INTERNET OF THINGS LABORATORY			
LAB COURSE CODE	U23CSP62			
LAB COURSE STRUCTURE	LECTURE	TUTORIAL	PRACTICAL	CREDIT
	0	0	4	2
REGULATION	BRANCH	YEAR	SEMESTER	ACADEMIC YEAR
2023	ECE	III	VI	2025-2026
COURSE INCHARGE				

SYLLABUS

COURSE OBJECTIVE:

- ❖ To connect Arduino board with internet.
- ❖ To Deploy an IoT application using Arduino / Raspberry Pi and appropriate sensor and actuator.
- ❖ To Demonstrate the working of simple IoT task of LED control.
- ❖ To Design a simple Internet of Things (IoT) application using Arduino / Raspberry Pi, sensors and actuators.
- ❖ To Build an IoT system using mobile app as a mini project.

LIST OF EXPERIMENTS

1. Introduction to Arduino platform and programming.
2. Introduction to Raspberry Pi platform and python programming.
3. Turn ON and OFF the LEDs.
4. Identify the objects using IR and PIR sensor.
5. Measure the moisture level of soil using soil moisture sensor.
6. Measure the distance between the ultra-sonic sensor and the obstacle.
7. Identify the leakage of gas /smoke in the environment.
8. Measure the humidity and moisture value of the environment.
9. Control a LED using relay switch.
10. Identify the rain in the environment using rain sensor.
11. Explore different communication methods with IoT devices (Zigbee, GSM, Bluetooth)

MINI PROJECT

1. Line follower robot
2. Smart weather monitoring system
3. Smart lighting system
4. Smart waste management system
5. Smart parking system

TEXT/REFERENCE BOOKS:

1. Arshdeep Bahga,Vijay Madiseti, "Internet of Things- A hands-on approach", Universities Press, 2015

HARDWARE:

- Arduino UNO,Raspberry Pi,USB,IR,PIR Sensor, Soil Moisture Sensor, Ultrasonic Sensor, Gas/Smoke Sensor,DTH Sensor,LCD,Breadboard,LED,Power Cable,Relay.

SOFTWARE:

- Arduino IDE 2.1.0, Windows 10 -64bit ,Pycharm.

VIRTUAL LAB LINK:

https://www.youtube.com/watch?v=tUTr58fq308
https://www.youtube.com/watch?v=fFerO7wkni0
https://www.youtube.com/watch?v=EFvbS6XzTVo
https://www.youtube.com/watch?v=oZfgQdH0xQo
https://www.youtube.com/watch?v=pgOvNURUoT0
https://www.youtube.com/watch?v=8M2Tca1YdeU

EXP. NO.	NAME OF THE EXPERIMENTS	NO. OF PERIODS	CUMULATIVE PERIODS
CYCLE I			
1	Introduction to Arduino platform and programming.	2	2
2	Introduction to Raspberry Pi platform and python programming.	2	4
3	Turn ON and OFF the LEDs	4	8
4	Identify the objects using IR and PIR sensor	4	12
5	Measure the moisture level of soil using soil moisture sensor.	4	16
6	Measure the distance between the ultrasonic sensor and the obstacle	4	20
7	Identify the leakage of gas/smoke in the environment	4	24
8	Measure the humidity and moisture value of the environment	4	28
9	Control a LED using relay switch.	4	32
10	Identify the rain in the environment using rain sensor.	4	36
11	Explore different communication methods with IoT devices (Zigbee, GSM, Bluetooth)	4	40
CYCLE II			
12	Line follower robot	4	44

13	Smart weather monitoring system	4	48
14	Smart lighting system	4	52
15	Smart waste management system	4	56
16	Smart parking system	4	60

COURSE OUTCOME

At the end of the course, the student should be able to:

CO 1: Understand the concept of Internet of Things.

CO 2:Implement interfacing of various sensors with Arduino / Raspberry Pi.

CO 3:Demonstrate the ability to transmit data wirelessly between different devices.

CO 4:Show an ability to upload/ download sensor data on cloud an server.

CO 5:Implement IoT based street light control system.

CO 6:Implement IoT based weather monitoring system.

CO-PO MAPPING:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	1	1	1	1	2	-	-	-	1	1	1	2	2	-
CO2	1	1	1	1	2	-	-	-	1	1	1	2	2	-
CO 3	1	1	1	1	2	-	-	-	1	1	1	2	2	-
CO 3	3	2	1	1	2	-	-	-	1	1	1	2	2	-
CO 4	3	2	1	1	2	-	-	-	1	1	1	2	2	-
CO 5	3	2	1	1	2	-	-	-	1	1	1	2	2	-
CO 6	3	2	1	1	1	-	-	-	1	1	1	2	2	-
CO	1	1	1	1	2	-	-	-	1	1	1	2	2	-

ADDITIONAL EXPERIMENTS

EXP. NO.	NAME OF THE EXPERIMENTS	Identified Resource link
1	Voice controlled Home Automation	https://www.youtube.com/watch?v=hkOUWiv6v-w
2	Smart plant monitoring system	https://www.youtube.com/watch?v=OL7TNx9RquE
3	Door Automation	https://www.youtube.com/watch?v=LGFwCvSd42E
4	Bio metric Attendance system	https://www.youtube.com/watch?v=8M2Tca1YdeU
5	RFID Door Lock	https://www.youtube.com/watch?v=wHEwZ1uJExM

MODEL LAB DETAILS

BATCH	REGISTER NO.	MODE OF LAB CONDUCT	DATE	TIMING

LIST OF QUESTIONS

1. Familiarization with Arduino/RaspberryPi and perform necessary software installation.
2. To interface LED/Buzzer with Arduino/RaspberryPi and write a program to turn ON LED for 1sec after every 2seconds.
3. To interface 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.
4. To interface DHT11 sensor with Arduino/RaspberryPi and write a program to print temperature and humidity readings.
5. To interface motor using relay with Arduino/RaspberryPi and write a program to turn ON motor when push button is pressed.
6. To interface O LED with Arduino/RaspberryPi and write a program to print temperature and humidity readings on it.
7. To interface Bluetooth with Arduino/RaspberryPi and write a program to send sensor data to smart phone using Bluetooth.
8. To interface Bluetooth with Arduino/RaspberryPi and write a program to turn LED ON/OFF when '1'/'0' is received from smartphone using Bluetooth.
9. Write a program on Arduino/RaspberryPi to upload temperature and humidity data to things peak cloud.
10. Write a program on Arduino/RaspberryPi to retrieve temperature and humidity data from thing speak loud.
11. To install MySQL database on RaspberryPi and perform basic SQL queries.
12. Write a program on Arduino/RaspberryPi to publish temperature data to MQTT broker.
13. Write a program on Arduino/RaspberryPi to subscribe to MQTT broker for temperature data and print it.
14. Write a program to create TCP server on Arduino/RaspberryPi and respond with humidity data to TCP client when requested.

15. Write a program to create UDP server on Arduino/RaspberryPi and respond with humidity.

VIVA QUESTIONS

1. What is iot? / what is the internet of things?
2. What are the most important characteristics or features of iot?
3. How does the iot (internet of things) affect our everyday lives?
4. What industries can be benefitted from iot?
5. What are the different types of components used in iot?
6. What is raspberry pi?
7. What are the key advantages of iot?
8. What are the different types of sensors used in iot?
9. What are the biggest challenges or risks associated with iot?
10. What is pwm or pulse width modulation?
11. What are the different layers of the iot protocol stack, and why are they used?
12. What are the key differences between iot and iiot?
13. What is arduino used in iot?
14. What are the different types of communication models used in iot?
15. What is the basic difference between an iot device and a normal sensor device?
16. What is the bluegiga apx4 protocol?
17. What are some of the most common real-world applications of iot?
18. Explain the working of iot
19. Why is pwm used in iot?
20. What are the various wireless communications boards available in raspberry pi?
21. What do you understand by the thermocouple sensor?
22. What functions are used to read analog and digital data from a sensor in arduino?
23. What is shodan in iot?
24. What are the different available models in raspberry pi used in iot?
25. What are some most suitable databases for iot?
26. What is micropython?
27. What do you understand by sharding?
28. Which of the following service of aws provide virtual machine?
29. What does wsn represent in internet of things idea?
30. What is bluegiga apx4 convention for the internet of things (iot)?

31. What are the vital components of the internet of everything, (ioe)?
32. When you state internet of things, i'm not catching your meaning by the "thing"?
33. What is the distinction among iiot and iot?
34. Why will the internet of things be effective in the coming years?
35. Explain what is the internet of everything?
36. What kind of data does internet of things objects convey?
37. What are the critical parts that exist in the internet of things?
38. What is application of iot in healthcare?
39. Does intel provide iot platform?
40. Is mobile phone iot device
41. What are the iot software's?
42. What is zigbee Protocol for Internet of Things?
43. What is Wi-Fi Protocol for IOT?
44. What impacts will the Internet of Things have on energy sector?
45. What Companies are working on IOT?
46. What is the internet of everything?
47. Why Internet of Things will be successful in the coming years?
48. Difference between IIOT AND IOT?
49. What role does the network play in the Internet of Everything?
50. What is Iot Contiki?

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