LABORATORY HANDOUT

INTERNET OF THINGS LAB (ECE-515)

ECE-5TH SEMESTER

ACADEMIC YEAR (2024-25)

Dr Surbhi Sharma

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Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Sessional	Final Exam	Total
ECE-511	Internet of Things Lab	ESC	2	0	0	4	50	-	50

COURSE OUTCOMES

At the end of the course the student will be able to:	
CO1	Analyze the components of IoT system.
CO2	Develop an application with Node MCU and Arduino Nano.
CO3	Develop a sensor interface for IOT application.
CO4	Develop an interface between sensor and cloud to capture the real time data.
CO5	Design an application which can control an actuator using internet.

LIST OF EXPERIMENTS

S. No.	Title
1	Study of Arduino Uno, Raspberry Pi, ESP8266 and Arduino IDE
2	Interfacing of Analog sensor with Arduino and display the value in serial monitor
3	Interfacing of DHT-11 with Arduino Uno to acquire the temperature and humidity data
4	Communicate two XBEE modules in AT mode using Arduino Uno/Raspberry Pi
5	Controlling LED from remote location and publish the status on ThingSpeak cloud
6	Interfacing of ultrasonic sensor with Arduino Uno /Raspberry pi and display the distance in LCD
7	To interface Bluetooth with Arduino/Raspberry Pi and write a program to send sensor data to Smartphone using Bluetooth.
8	Write a program on Arduino/Raspberry Pi to upload and retrieve temperature and humidity data to/from thingSpeak cloud.
9	Write a program to create TCP server on Arduino/Raspberry Pi and respond with humidity data to TCP client when requested.
10	Write a program to create UDP server on Arduino/Raspberry Pi and respond with humidity data to UDP client when requested.
11	Read Cloud data with ESP8266 using Web Client/Server and control the actuator according to the Parameter
12	Upload the DHT-11 sensor data to MQTT cloud service using Node MCU

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LAB REPORT INSTRUCTIONS

- Provide specific title of the lab experiment.
- Theory: Provide a concise abstract (typically 100-200 words) that summarizes the purpose, methods, key findings, and significance of the experiment.
- Materials/ Equipment: List all materials, components, and equipment used in the experiment. Include specifications when applicable.
- Software/Simulation Tools:
- Experimental Procedure: Describe the step-by-step procedure for conducting the experiment. Be detailed and clear in your instructions. Include diagrams or schematics to illustrate the setup, connections, and component placement. Explain any variations or adjustments made to the standard procedure.
- Observation & Calculations/Analysis: Detail the data you collected during the experiment. Include descriptions of measurements and any calculations made. Use tables, charts, or graphs to present data clearly. Discuss any trends, patterns, or significant observations. Interpret the data in the context of the experiment's objectives. Ensure that all figures, tables, and equations are correctly labeled.
- Results: Summarize the key findings of the experiment. Present results in a clear and organized manner using tables and graphs. Include units of measurement and labels for data points.
- Conclusion: Provide a concise summary of the experiment's key points and outcomes.

GRADING AND ASSESSMENT

- **Continuous Evaluation**: 30 marks
- **Final Demo & Viva**: 10 marks
- **Attendance**: 10 marks
- **Lab Overall Marks**: 50 marks

COURSE POLICIES

- **Attendance**: Minimum 75% attendance is mandatory to appear in the final examination of the course.
- **Late Submissions**: Manuals and projects must be submitted by the specified timelines.

FACULTY INFORMATION

- **Office Hours**
  Tuesday (12:055 PM - 01:45 PM)

- **Contact Information**
  surbhi.ece@mietjammu.in

RUBRICS FOR LAB CONTINUOUS EVALUATION

Parameters	Performance			Marks
	Low	**Medium**	**High**	
Execution of the Experiment	Student was not able to setup and conduct the Experiment completely	Student was able to setup and conduct the experiment but measurement/results/observations were not correct	Students was able to set and conduct the experiment and the measurement/results/observations were not correct	10
	0-2 Marks	3-6 Marks	7-10 Marks	
Record	Student was not able to describe the detailed procedure and could not record the measurement.	Student was able to describe the detailed procedure partially or with some inaccuracy.	Student was able to describe the detailed procedure accurately and record all measurements correctly.	10
	0-2 Marks	3-6 Marks	7-10 Marks	
Viva Voice	Students could not demonstrate sufficient knowledge of foundation, functional or applied aspects related to the experiment during viva.	Students demonstrated sufficient knowledge of foundation, functional or applied aspects related to the experiment during viva.	Students demonstrate strong knowledge of foundation, functional or applied aspects related to the experiment during viva	10
	0-2 Marks	**3-6 Marks**	**7-10 Marks**	
Total Marks				**30**

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