

Program : Diploma in Computer Engineering / Computer Hardware Engineering / Information Technology	
Course Code : 6139A	Course Title: Internet of Things Lab
Semester : 6 / 5 / 6	Credits: 1.5
Course Category: Program Elective	
Periods per week: 3 (L:0 T:0 P:3)	Periods per semester: 45

Course Objectives:

- Provide skills to build Internet of Things (IoT) systems.

Course Prerequisites:

Topic	Course code	Course name	Semester
Programming Concepts		Programming in C Lab	3
Basic Electronics		Fundamentals of Electrical and Electronics Engineering Lab	2

<course code> *Internet of Things should be registered along with this*

Course Outcomes :

On completion of the course, the student will be able to:

CO _n	Description	Duration (Hours)	Cognitive Level
CO1	Develop simple IoT applications using computing boards (Node MCU/Arudino etc) and sensors	12	Applying
CO2	Identify Python programming constructs for IoT applications	10	Applying
CO3	Develop IoT applications using Raspberry PI	12	Applying
CO4	Design and develop an IoT application to solve problems	8	Applying
	Lab Exam	3	

CO – PO Mapping

Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
CO1	3			3			
CO2	3			3			
CO3	3			3			
CO4	3	3	3	3	3	3	3

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline

Module Outcomes	Name of the Experiment	Duration (Hours)	Cognitive Level
CO1	Develop simple IoT applications using computing boards (Node MCU/Arudino/ESP32 etc) and sensors		
M1.01	Experiment with Computing boards and sensors to familiarize with IoT gadgets.	2	Applying
M1.02	Develop simple IoT applications with computing boards and sensors	6	Applying
M1.03	Develop applications to control sensors through web page, mobile applications	2	Applying
M1.04	Implement applications to upload data to cloud	2	Applying
CO2	Identify python programing constructs for IoT applications		
M2.01	Recall Programming concepts of Python – data types, list, tuple, dictionaries etc	2	Remembering
M2.02	Recall control structures in Python	2	Remembering
M2.03	Develop Programs using functions, packages and modules	3	Applying
M2.04	Make use of Python packages for IoT	3	Applying
	Lab Exam – I	1.5	
CO3	Develop IoT applications using Raspberry Pi		
M3.01	Experiment with Raspberry PI	4	Applying
M3.02	Develop Simple IoT applications with Raspberry PI to interact with web, mobile applications and cloud	8	Applying

CO4 : Design and develop an IoT application to solve problems			
M4.01	Open ended Experiment**: Design and develop an IoT application to solve a real world problem.	8	Applying
	Lab Exam – II	1.5	

**** - Suggested Open Ended Experiment**

(Not for End Semester Examination but compulsory to be included in Continuous Internal Evaluation. Students can do open ended experiments as a group of 2-3. There is no duplication in experiments between groups.)

1. Design and develop an IoT application to acquire/read data about the location from so many visitors entering into a mall.

Text / Reference

T/R	Book Title/Author
T1	RMD Sundaram Shriram K Vasudevan, Abhishek S Nagarajan, Internet of Things , Wiley Publications
R1	Vijay Madiseti, Arshdeep Bahga, Internet of Things: A Hands-On Approach , Orient Blackswan
R2	Raj Kamal, Internet of Things : Architecture And Design Principles , McGraw Hill Education
R3	Gary Smart, Practical Python Programming for IoT , Packt Publishing
R4	Marco Schwartz, Internet of Things with Arduino Cookbook , Packt Publishing

Online Resources

Sl.No	Website Link
1	https://nptel.ac.in/courses/106/105/106105166/
2	https://www.raspberrypi.org/blog/getting-started-with-iot/
3	https://learn.adafruit.com/category/internet-of-things-iot
4	https://www.arduino.cc/en/IoT/HomePage
5	http://esp32.net/