

GOVT. POLYTECHNIC, HAMIRPUR (H.P.)
Lesson Planning and Coverage

Branch: Information Technology

Semester: 4th

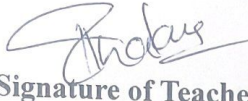
Subject: Internet of Things

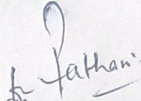
Session: Jan-2024

Teacher: Pratibha Thakur

Laboratory: IOT lab

Sr. No.	No of Lectures	Chapter/Unit Description	Detailed contents	Reference Resources	Remarks
1	10	Introduction to Internet of Things	Embedded Systems, M2M, Internet of Things (IoT), Characteristics of IoT, Advantages of IoT, IoT Enabling Technologies, : Smart Objects and Smart Environments, IoT Applications - Home Automation, Smart Cities, Smart Grids, Industrial IoT, Smart Farming; IoT Framework, IoT Challenges	R1, R2,R3	
2	10	Physical & Logical Design of IoT	IoT Devices - Microcontroller Unit (MCU), Transducers, Actuators - Hydraulic, Pneumatic, Electrical, Thermal, Magnetic and Relay Actuators; Sensors - Location, Biometric, Acoustic, Environmental, Motion; Components of IoT - Things, Gateway, Cloud, Analytics, User Interface; Physical Design of IoT - Things in IoT, IoT Protocols; IoT Application Layer Protocols - AMQP, CoAP, MQTT, Logical Design of IoT: IoT Functional Blocks, IoT Levels and Deployment Templates.	R1, R2,R3	
3	10	IoT Architecture and Communication Technologies	One M2M Architecture, IoT World Forum (IoTWF) Standardized Architecture, IoT Communication Technologies - ZigBee, BLE, Wifi, 802.15.4 , RFID, NFC; IoT Processing-On-site and Off-site Processing, Processing Offloading;	R1, R2,R3	
4	8	IoT Supporting Technologies and Applications	Overview of Edge Computing, Fog Computing, and Cloud Computing, Study of IoT Applications in Agriculture, Healthcare, Smart Homes, Connected Vehicles	R1, R2,R3	
5	10	IoT Implementation	Arduino Boards, Arduino UNO - Features, Functional Blocks, Digital and Analog Pins; Arduino Sketch - setup() and loop() Functions, Serial Monitor; Raspberry Pi Features, Components, Comparison with Arduino, Raspberry Pi OS, IoT COTS Sensors, Overview of AWS IoT	R1, R2,R3	


Signature of Teacher with Date
27/01/24


Signature of HOD

Reference Books & Online Resources

1. Internet of Things: A Hands-on Approach, by A. Bahga, Universities Press
2. Internet of Things : Principles and Paradigms, by Raj Kumar Buyya
3. Internet of Things : Architecture and Design Principles by Raj Kamal, MGH
4. Online Arduino Tutorials at <https://docs.arduino.cc/tutorials>
5. Online Raspberry Pi Tutorials at <https://projects.raspberrypi.org>

COURSE OUTCOMES:

After completing this course students will be able to:

- CO-4.5.1 Understand the basic terminology associated with Android Programming.
- CO-4.5.2 Explain various versions of android operating systems.
- CO-4.5.3 To understand the android architecture and various tools available in android studio.
- CO-4.5.4 To understand app development using Android studio.

GOVT. POLYTECHNIC, HAMIRPUR (H.P.)
Practical Planning

Branch: Information Technology

Semester: 5th

Subject: Internet of Things

Session: July 2023

Teacher: Pratibha Thakur

Lab: IOT Lab

Sr. No.	No of Practical hours planned	Aim of the Practical	Reference for Procedure/ Writeup	Remarks
1	6	To use resistances, LEDs, battery, push button, breadboard and potentiometer in a circuit on the tinkercad circuit simulator (https://www.tinkercad.com/) and troubleshoot it using a multimeter.	R1, R2	
2	8	To study the major components available on the Arduino UNO board and develop an Arduino Sketch to blink three LEDs after installing/configuring the latest version of Arduino IDE on a Linux/Windows machine.	R1, R2	
3	6	To interface basic sensors (LM35, HC-SR04, MQ135, PIR, Soil & Moisture, IR, LDR, sound sensor, push button, etc.) and actuators (LED, motor, buzzer etc.) with Arduino UNO.	R1, R2	
4	8	To switch ON/OFF an electric bulb with and without Bluetooth/WiFi module using Arduino UNO and relay module.	R1, R2	
5	6	To send a sensor's data to the cloud (ThingSpeak/UBIDOTS/any other cloud) using Arduino UNO.	R1, R2	
6	6	To study the major components available on the Raspberry Pi single board computer (SBC) and remotely accessing it using SSH/(VNCViewer) after installing (Headless installation) the latest version of Raspberry Pi OS on it.	R1, R2	
7	8	To send DHT11/DHT22 temperature sensor data (or any other sensor data) to the ThingSpeak/UBIDOTS cloud (or any other cloud) using Node-Red editor on a Raspberry Pi SBC.	R1, R2	
8	8	To setup and use the MOSQUITTO MQTT broker on the AWS cloud (or on Raspberry Pi locally) and publish/subscribe topics using a smartphone having the MQTT Dashboard Android App (or having similar App).	R1, R2	

References:

R1: Lab Manual

R2: <https://create.arduino.cc/>

Pratibha Thakur
(Pratibha Thakur)

Date: - 27/01/24