Six Weeks Summer Internship

on

Internet of Things (IoT): Fundamentals and Industry Based Real Time Applications

(Blended Mode)
(Theory Fundaments: Online and Implementation: Offline)

13 June–22 July 2022

Jointly Organized by

Department of Information Technology
&
Department of Electronics and Communication Engineering

Indira Gandhi Delhi Technical University for Women, Delhi

Patron

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About the Summer Internship Program

The technical sessions and live project implementation for Summer Internship program on "**Internet of Things (IoT): Fundamentals and Industry Based Real Time Applications**" will be conducted from **13 June –22 July 2022 Jointly Organized by Department of Information Technology & Department of Electronics and Communication Engineering at IGDTUW, Delhi**. The students will be learning the following **concepts and live project implementation** in the given sub-areas of IoT:

Technical Contents along with Tentative List of Project to be Implemented

- ❖ What "**the Internet of Things**" means and how it relates to **Cloud computing** concepts.
- ❖ How **open platforms allow** you to store your **sensor data** in the **Cloud**.
- ❖ The basic usage of the **Arduino, Raspberry Pi & Node-MCU environment** for creating your **own embedded projects** at low cost.
- ❖ How to connect your **Arduino & Raspberry Pi with your Android phone.**
- ❖ Basic usage of **Raspberry Pi**.
- ❖ Use of **Arduino & Raspberry Pi in internet of things (IoT)**
- ❖ How to create your own Android App using MIT App Inventor.
- ❖ How to send data to the **Internet and talk to the Cloud.**
- ❖ How to **update sensor readings** on **Twitter** (Social Networking Sites).
- ❖ How to **control any device from anywhere across the world.**
- ❖ How to connect to **cloud ready IoT Server using MQTT**.

NOTE: On completion of each theory concept sessions, students will carry out the live project problem implementation activities.

Programming languages to be covered:

- ❖ C Language
- ❖ Python
- ❖ Embedded C
- ❖ HTML, CSS, JavaScript
- ❖ Linux scripting

Career Opportunity for IoT engineer internship

IoT Internship Training provides a real time exposure for the students in the latest and emerging technologies that will help in placement as well as skill Enhancement:

- ❖ IoT Embedded System Designer
- ❖ IoT developer
- ❖ IoT creator
- ❖ IoT Infrastructure Architect
- ❖ IoT solutions Engineer
- ❖ IoT System Administrator
- ❖ Cloud engineer

Details of Technical Contents to be Covered During the Intership

Introduction to the Internet of Things

- The Internet of Things
- The Basics of Sensors & Actuators
- Introduction to Cloud Computing
- The Arduino Platform

The Arduino Open-Microcontroller Platform

- Arduino Basics
- Arduino Board Layout & Architecture
- Reading from Sensors
- Programming fundamentals (C-language)

Arduino Programming & Interface of Sensors

- Interfacing sensors with Arduino
- Programming Arduino
- Reading from Sensors
- Embedded Projects

Project Implementation based Arduino Programming & Interface of Sensors

Project 1: Simple LED Program for Arduino

Project 2: LED Blink Project

Project 3: Traffic Light Control

Project 4: Displaying Date on Serial Monitor

Project 5: Automated Door Opening System

Project 6: LCD Interfacing

Project 7: LDR Interfacing

Project 8: Smart Street Light System

Project 9: Integrating Sensors & Reading Environmental Physical Values.

Project 10: Reading Environmental Values on Android Smartphone.

Connecting Arduino with Mobile Device

- The Android Mobile OS.
- Using the Bluetooth Module

Project Implementation based on Connecting Arduino with Mobile Devices

Project 11: Creating Android App using MIT App Inventor & Sensor Data on the App.

Project 12: Voice Controlled Mini Home Automation using Android Smartphone.

Project 13: Creating Android App using MIT App Inventor & Controlling Devices Connected to Controller.

Project 14: Control Devices using Local host Web Server for Home Automation.

Make Electronics Gadget Talk to Internet

- ❖ Integrating Ethernet Module
- ❖ Creating App on Twitter

Project 16: Send Voltage & Analog Data on Cloud Server.

Cloud Computing

- Communicating with the Cloud using Web Services.
- Cloud Computing & IoT.
- Popular Cloud Computing Services for Sensor Management.

Project 17: Use Arduino to upload free data from Environmental Sensors to Cloud Server.

Project 18: Automatically update status on Twitter based on Sensor Data.

Project 19: Control Electronic Devices from anywhere across the world using Internet & Mobile App.

Understanding and Introduction to RPi

What is SOC?, Versions of Raspberry Pi & Their Difference, Raspberry Pi 3, Basics of Electronics, Hardware Description, Pin Configuration, OS Installation on SD Card, Downloading Image, Study Various Operating Systems Available, Making SD Card: Formatting and Partitions, Raspberry Pi SD Installer, OS Configuration

Booting Into Desktop

GUI Version, CLI Desktop, Changing Time zone, Other Options, Raspi-Config, Test Network Setup, Setting Up Using GUI, Setting Up Using Command Line, Finding Pi's IP Address, connecting with Wi-Fi/ LAN/ Data card, GPIO, Study GPIO Pins, Libraries Using Git, Configuring GPIO Pins, Pi using SSH, Enabling SSH, Logging in using Putty, Basic Commands, Use GPIO and Linux.

Understanding Linux

File Structure, Linux Commands, Permissions.

Understanding Python

Condition Statement, Loops, Importing Libraries, Functions

Project 20: LED Program with Raspberry Pi

Project 21: Controlling LED with a Switch using Raspberry Pi

Project 22: Integrating IR Sensor with Raspberry Pi.

Project 23: Integrating DHT11 with Raspberry Pi.

Project 24: Sending Sensor Data to Cloud using Raspberry Pi.

Introduction to MQTT & Communication Protocol for IoT

Understanding MQTT, Difference between HTTP & MQTT, Understanding MQTT Broker, Understating Publish & Subscribe Methods, Introduction about Node-MCU, Connecting to Local Wi-fi, Getting Static IP, Pinging a Particular Site for Results.

IOT Kits and Components for Live Project Implementation:

The list of components and equipments are provided by the University for the Demonstration of the Industry Based Real Time Applications during the internship program..

IoT Resource Persons from Industry and Academia

The resource persons are from the reputed academic institutions and Industry with vast experience in the area of IoT domain going to cover the fundamentals and demonstrate the Industry Based Real Time Applications during the internship program.

Who can Apply

Internship is open to B.Tech., M.Tech., MCA. Students having knowledge of Basic Electronics.

How to Apply

Interested candidates should fill the online registration formlatestby30.05.2022 by05:00pm at the following link: https://forms.gle/sxc2v1YHRNjoFhQU9

Registration Fee:

Rs1000/-(for IGDTUW Students)

Rs 2,000/- (for Outside IGDTUW students)

Bank Details for Registration Fee Payment

Name and Address of Beneficiary	:	IGDTUW, Anveshan Foundation
Bank Account Number	:	09001000021199
IFSC Code	:	PSIB0001098
Name and Address of Bank	:	Punjab and Sind Bank, KashmereGate,Delhi110006

Certificate

On successful completion of the Internship certificate shall be awarded.

Contact Us

For any Query, please write to hodit@igdtuw.ac.in.