JEPPIAAR INSTITUTE OF TECHNOLOGY

"Self-Belief | Self Discipline | Self Respect"

Name of the course: Internet of Things – IoT OverviewCourse

code: IVA002

Course Duration: 32 hours

Academic Year: 2022 -2023

Coordinator: Ms. Mercy Sharon Devadas. AP/ ECE

CURRICULUM FOR COURSE- INTERNET OF THINGS (IOT) **L T P C**
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Course Objective:

- To provide knowledge about Basics of Linux, SQL, PHP, IP Layers
- To know the concepts of Arduino, ADC, DAC, Sensors and Raspberry pi3
- To understand the concept of Wireless sensor networks
- To know the configuration of IoT protocols, Gateway and Devices.
- To impact the IoT in Real Time Project.

UNIT 1 - INTRODUCTION TO IOT AND CLOUD PLATFORM 6

Introduction to IoT – IoT definition – Characteristics – IoT Complete Architectural Stack – IoT enabling Technologies – IoT Challenge. Development environments for service development; Amazon, Azure, Google Appcloud platform in industry

UNIT 2 EMBEDDED SYSTEM DESIGN 6

Embedded System design aspects for IoT-Embedded System design Interfacing (UART, I2C and SPI)- Arduino Platform and Tool, Arduino GPIOs and LCD interfacing-Interfacing with ADC (Types of ADCs with suitable application and their operations), Basics of DAC, accelerometers-**Environment Monitoring Sensors**-Water Monitoring Sensors-Interfacing Microphones and Cameras with Raspberry Pi3

UNIT 3 - WIRELESS SENSOR NETWORKS 6

Introduction to WLAN - IEEE 802.11 Standards – Architecture – Services Application development –Raspberry Pi3 Camera data transfer using WLAN WiFi module-Working with ESP8266- Interfacing ESP8266 with Arduino MEGA

UNIT 4 -NETWORKING 6

Configuration issues with OS for Networking - Troubleshooting Networks -Understanding of IoT protocol stack - IoT Architecture and Standards - IoT Layers-Basic Communication Networking-Ipv4/IPv6-Networking with IoT Devices an EDGE and Gateway-Could Connectivity.

UNIT 5 – APPLICATION OF IoT 6

System Design for a Particular Sensor- Introduction- Power Supply Requirement-Digital I/O Isolation Mechanisms- Sampling & Actuator-Environment monitoring using GAS sensors-Low-WPAN, Zigbee, IEEE 802.15.4 Case studies with architectural analysis: IoT applications – Smart City – Smart Water – Smart Agriculture – Smart Energy – Smart Healthcare – Smart Transportation – Smart Retail – Smart waste management.

S.no	Lab Assignments
1	Introduction MSP 430 Programming environment
2	• Working with Arduino software • Getting started with Arduino MEGA 2560 • Programming Arduino MEGA • Library writing and port assignment for Arduino
3	• Interfacing two Arduino board with I^2C and UART with terminal, LCD interfacing
4	Interfacing with MSP 430 and CC2520 using SPI
5	Instrumentation and Sensors - Water and Environment Monitoring (Practical) • Interface of Sensors (with Inbuilt transmitter) with ADC (3 Hours) o Gain and Offset Calculation o Interfacing with ADC • Interface of Sensors with Serial Communication (3 Hours) • Temperature Measurement using Thermocouple (4 Hours) o Circuit Development o Interface and Testing
6	Msp 430 + cc2520 + raspberry pi 3
7	• Working with Arduino ADC • Interfacing LDR, IR sensor and Gas sensors
8	• Interfacing DS18B20, PIR, Ultrasonic sensor and GPRS module
9	Working with camera and microphone with Raspberry pi3
10	• Buzzer interfacing • Relay interfacing • Stepper motor
11	Setting up Apache WebServer, MySQL, PHP and PhpMyadmin (Installation and Configuration)
12	Hands on with MySQL and PHP programming
13	Hands on with Networking and its troubleshooting
14	Networking with IoT Devices
15	Python programming
16	• Programming ESP8266 standalone and interfacing with Arduino MEGA for Internet
17	How to connect various IoT devices and establish communication among these devices.
18	How to send and receive data on IoT devices at edge, gateway and server levels.
19	System Design for a Particular Sensor (10 Hours)
	o Introduction
	o Power Supply Requirement
	o Digital I/O Isolation Mechanisms
	o Sampling & Actuator
20	Mini Project

References

1. Peter Waher, "Learning Internet of Things", PACKT Publishing, 2015.
2. Honbo Zhou, "The Internet of Things in the Cloud A MiddleWare Perspective", CRC Press, 2013
3. Huansheng Ning, "Unit and Ubiquitous Internet of Things", CRC press, 2013.
4. Charles Bell, "Beginning Sensor Networks with Arduino and Raspberry Pi", Apress open.
5. Warren Gay, "Raspberry Pi Hardware Reference", friends of apress.

Theory -15 Hrs, Practical-15 Hrs

Course Outcomes

1. Learned the basic concepts of Linux, SQL, PHP, IP Layers.
2. Acquired the concepts of Embedded System design aspects for IoT
3. Acquired the knowledge of Wireless sensor networks
4. Able to understand the Networking with IoT Devices
5. Ability to design IoT network for Realtime Application.

Course Name : **INTERNET OF THINGS (IOT)**
Branch : Common to ALL Branches

SCHEDULE OF TRAINING PROGRAM

Date	12.45 pm to 1.45 pm	1.45 pm to 2.45 pm
Day 1	Lecture 01	Lecture 02
Day 2	Lecture 03	Lecture 04
Day 3	Lecture 05	Lecture 06
Day 4	Lecture 07	Lecture 08
Day 5	Lecture 09	Lecture 10
Day 6	Lecture 11	Lecture 12
Day 7	Lecture 13	Lecture 14
Day 8	Lecture 15	Practical Session 1
Day 9	Practical Session 2	Practical Session 3
Day 10	Practical Session 4	Practical Session 5
Day 11	Practical Session 6	Practical Session 6
Day 12	Practical Session 8	Practical Session 9
Day 13	Practical Session 12	Practical Session 11
Day 14	Practical Session 14	Practical Session 15
Day 15	Exam preparation class for CPTP	

ENROLLED LIST OF STUDENTS

S.NO	REGISTER NO.	NAME
1	210621106001	AASHIKA.P.S
2	210621106002	ABISHEK.S
3	210621106003	AJAI.M
4	210621106004	AKASH.R
5	210621106005	ANTONY STYRIS.R
6	210621106006	ARAVINDAN.P
7	210621106007	ARULMOZHI.P
8	210621106008	AVINASH.K
9	210621106009	BATHMANBAN.V
10	210621106010	BAVITHRA.P
11	210621106011	BHUVANASRI.S
12	210621106013	CHARULATHA.R

13	210621106014	DAVINS RANITH.J
14	210621106015	DEEPIKA.C
15	210621106016	DEEPIKA.M
16	210621106017	DEEPIKA.P
17	210621106018	DHARANI.S
18	210621106019	EDWIN INBARAJ.V
19	210621106020	GIRIDHARAN.P
20	210621106021	GOKULNATH.R
21	210621106023	GOWTHAM.K.S
22	210621106024	HARISH.S
23	210621106025	HEMALATHA.M
24	210621106026	JACKULINE VALENTINA.S
25	210621106027	JEDANCE.S
26	210621106028	KIRUTHIKA.K
27	210621106029	KISHORE M
28	210621106030	KISHORE KUMAR K
29	210621106031	LATHESH.M
30	210621106033	MADHAN.S
31	210621106034	MADHUBALA.S
32	210621106035	MOKSHITHA.S.V
33	210621106036	NATHANIAL.V
34	210621106038	NIVETHA.K
35	210621106039	POOJA SRI .B
36	210621106040	PRITHIVIRAJ.T.K
37	210621106041	PRIYADHARSHINI.R
38	210621106042	RENITHA.A

39	210621106043	SAHAYA SWEETNE.J
40	210621106044	SANGEETHA.A
41	210621106045	SANTHIYA.M
42	210621106046	SANTHOSH KUMAR.V
43	210621106047	SELVAMEENA.N
44	210621106048	SHOFIYA.M
45	210621106049	SRIRAM .R
46	210621106050	SRUTHIKDHAYA
47	210621106052	SURIYA.K
48	210621106053	SURIYA.M
49	210621106054	TAMILKUDIMAGAN.M
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51	210621106301	ANTONY JEFFREY
52	210621106302	ANTONY SIMSON

SUMMARY REPORT WITH COURSE OUTCOME

Department of Electronics and Communication Engineering has organized Anna University Approved Value- added Course on “Internet of Things” from 01-08-2022 to 19-011-2023 in online mode for all second years for a duration of 32 Hrs. Evaluation process is carried out through internal assessment and the same was reported to the Anna University. The Students were graded based on the internal assessment and all the enrolled students completed the course successfully. The Course has enabled the students to get trained as a Internet of Things developers which helps in getting placement requisites.

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