Lok Jagruti Kendra University
University with a Difference

Diploma
in
Electrical Engineering

Course Code: 025070505
Internet of Things

Programme / Branch Name			Diploma in Electrical Engineering			
Course Name	Internet of Things				**Course Code**	025070505
Course Type	HSSC	BSC	ESC	PCC	OEC	PEC

Legends: HSSC: Humanities and Social Sciences Courses   BSC: Basic Science Courses
ESC: Engineering Science Courses   PCC: Program Core Courses
OEC: Open Elective Courses   PEC: Program Elective Courses

1. Teaching and Evaluation Scheme

Teaching Hours / Week / Credits				Evaluation Scheme			
L	**T**	**P**	**Total Credit**	**CCE**	**SEE (Th)**	**SEE (Pr)**	**Total**
4	0	2	5	50	50	50	150

Legends: L: Lectures   T: Tutorial   P: Practical
CCE: Continuous & Comprehensive Evaluation
SEE (Th):   Semester End Evaluation (Theory)
SEE (Pr):   Semester End Evaluation (Practical)

2. Prerequisite
- ✓ Physics and Mathematics (Pre-university level)
- ✓ Measure basic electrical quantities/parameters
- ✓ Use major electrical/electronic machines//instrument/equipment

3. Rationale
Internet of Things plays an important role in connecting the things i.e., variety of devices through the Internet. The IoT has emerged as a cutting-edge technology with applications in manufacturing, healthcare, Agriculture, transport, mining, smart cities and many more. This subject covers the fundamentals of IoT with its architecture, protocols and Applications. It also covers the overview and programming of two widely used IoT platforms Arduino and Raspberry Pi.

4. Objectives
- ✓ Emphasizes on developing required skills amongst students and tests the outcomes of the study of a course, as opposed to routine learning.
- ✓ This approach creates an ability to acquire knowledge and apply fundamental principles to analytical problems and applications.
- ✓ Diagnose the various IoT protocols with detailing of their elements and overall functioning within IoT systems for efficient communication.
- ✓ Demonstrate the architecture and functioning of IoT systems including the sensors and microcontrollers with their interfacing and software need considering application areas.

5. Contents

Unit No.	Unit Name	Topics	Learning Outcomes	% Weightage	Hours
1.	**Introduction and Design Principle**	1.1 IOT, Frame work 1.2 Architectural view 1.3 Technology behind and sources 1.4 M2M communication 1.5 M2M system layers, design 1.6 Data enrichment, consolidation 1.7 Web communication protocol, 1.8 Message communication protocol	• Introduction to technology • Protocol communication and architecture	20	10
2.	**Data Processing**	1.1 Internet connectivity and communication 1.2 IP addressing 1.3 Media access control 1.4 HTTP, HTTPS, FTP protocols 1.5 Data acquiring, storage and organizing 1.6 Cloud base data process	• Cloud based data collection, processing, storage and organizing.	20	12
3.	**Sensors**	1.1 Sensor technology 1.2 Industrial IoT and automotive IoT 1.3 Actuator 1.4 Sensor data communication protocol 1.5 RFIT 1.6 Wireless sensors	• Types of sensors and communication protocol	20	12
4.	**Prototype and designing**	1.1 Embedded computing basic 1.2 Platform prototyping 1.3 Things connected to cloud 1.4 Prototyping software	• Leverage the benefits of IoT technologies for automating • The various real-life challenges in various application areas	20	12
5.	**Arduino and Raspberry Pi**	1.1 Arduino: Architecture, Programming and Application 1.2 Raspberry Pi: Architecture, Programming and Application	• Develop the software components of IoT system using Arduino/Raspberry Pi Programming	20	10

6. List of Practical / Exercises
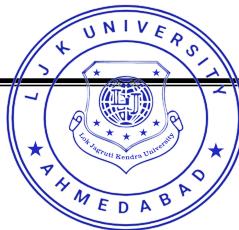
The practical/exercises have been properly designed and implemented in an attempt to develop different types of skills, so that students can acquire the competencies/programme outcomes. Following is the list of practical/exercises.

Practical should be performed by students based on
- Using Arduino or Raspberry Pi boards and its software platforms

7. Suggested Specification Table for Evaluation Scheme

Unit No.	Unit Name	Teaching Hours	Distribution of Topics According to Bloom's Taxonomy					
			R %	U %	App %	C %	E %	An %
1	Introduction and Design Principle	10	30	20	30	5	5	10
2	Data Processing	12	30	30	10	10	10	10
3	Sensors	12	30	30	10	10	10	10
4	Prototype and designing	12	20	30	20	5	5	20
5	Arduino and Raspberry Pi	10	40	20	10	10	10	10

Legends: R - Remembering   App – Applying   E- Evaluating
U - Understanding   C – Creating   An- Analyzing

8. Textbooks
1) INTERNET OF THINGS Architecture and Design Principles by Raj Kamal, McGraw Hill
2) Introduction to IoT by Sudip Misra, Cambridge University

9. Reference Books
1) Internet of Things by Simone Cirani, Marco Picone, Wiley
2) Internet of Things by Internet of Things, Elsevier-British Library

10. Open Sources (Website, Video, Movie)
1) https://www.tutorialspoint.com/internet_of_things/index.htm
2) https://www.iotworldtoday.com/
3) https://aws.amazon.com/iot/
4) https://www.cisco.com/c/en_in/solutions/internet-of-things/overview.html
5) https://www.cisco.com/c/en_in/solutions/internet-of-things/iot-network-connectivity.htm