



मेडी-केप्स विश्वविद्यालय, इंदौर

Medi-Caps University, Indore

Syllabus

Course Code	Course Name	Hours per Week			Total	
		L	T	P	Hrs.	Credits
CA5EL53	Internet of Things	4	0	0	4	4

Course Objectives:

1. To understand the fundamentals of Internet of Things.
2. To learn about the basics of IOT protocols.
3. Explore on use of various hardware and sensing technologies to build IoT applications.
4. To build a small low cost embedded system using Raspberry Pi.
5. To apply the concept of Internet of Things in the real world scenario.

Prerequisites : Nil

Co-requisites : Nil

Curriculum:

Unit-I

Introduction : Defining IoT, Characteristics of IoT, Physical design of IoT, Logical design of IoT, Functional blocks of IoT, Communication models & APIs, IoT levels and deployment, domain specific IoTs. Introduction to Arduino and Raspberry Pi

Unit-II

IoT and M2M: Machine-to-Machine (M2M), Difference between M2M and IoT, M2M Value Chains, IoT Value Chains, SDN (Software Defined Networking) and NFV (Network Function Virtualization) for IoT, Data Storage in IoT, IoT Cloud Based Services.

Unit-III

IOT Protocols - Wi-Fi (IEEE 802.11), Bluetooth, ZigBee (IEEE 802.15.4), IPv4, IPv6, 6LoWPAN. TCP, UDP, Constrained Application Protocol (CoAP), MQ Telemetry Transport (MQTT), XMPP, AMQP, HTTP, Web Sockets.

Unit –IV

Web Of Things - Web of Things versus Internet of Things, Two Pillars of the Web, Architecture Standardization for WoT, Platform Middleware for WoT , Unified Multitier WoT Architecture, WoT Portals and Business Intelligence.

Unit-V

IOT Applications - IoT applications for industry: Future Factory Concepts, Greenfield and Brownfield IoT, Smart Objects, Smart Applications. Study of existing IoT platforms /middleware

List of Practical's: Nil**Course Outcomes:**

- A. Understand IoT and its applications
- B. Data and Knowledge Management and use of Devices in IoT Technology
- C. Apply interfacing techniques for hardware & Sensors connectivity
- D. Development of IoT platform for real world applications
- E. Real World IoT Design Constraints, Industrial Automation and Commercial Building automation in IoT

Text Books:

- 1. IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things”, by David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Robert Barton, Jerome Henry; 1st Edition, 2018, Pearson India Pvt. Ltd.
- 2. “Internet of Things: A Hands-on Approach”, by Arshdeep Bahga and Vijay Madisetti, 1st Edition, 2015, Universities Press (India) Pvt. Ltd.
- 3. Rajkamal, ”Internet of Things”, Tata McGraw Hill publication
- 4. Jan Ho” ller, Vlasios Tsiatsis , Catherine Mulligan, Stamatis , Karnouskos, Stefan Avesand. David Boyle, "From Machine-to-Machine to the Internet of Things - Introduction to a New Age of Intelligence",.
- 5. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD)

Reference Books:

- 1. Olivier Hersent, David Boswarthick, Omar Elloumi , “The Internet of Things – Key applications and Protocols”, Wiley
- 2. Dimitris N. Chorafas, Cloud Computing Strategies
- 3. Velte, “Cloud Computing- A Practical Approach”, TMH Pub
- 4. Adrian McEwen, “Designing the Internet of Things”, Wiley Publishers

Web Source:

- 1. <https://dzone.com/articles/introduction-to-iot-sensors>
- 2. https://www.cisco.com/c/dam/en_us/solutions/trends/iot/introduction_to_IoT
- 3. <https://www.codeproject.com/Articles>

Open Learning Source:

- 1. https://onlinecourses.nptel.ac.in/noc17_cs22
- 2. <https://github.com/connectIOT/iottoolkit>