21IOT16	COGNITIVE IOT	L	T	P	C
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Course Objectives

- To emphasis the students from shifting their mindset from theoretical to practical multi-disciplinary skills through installing the know-how of actual practice in industry field.
- Impart the knowledge to log the sensor data and to perform further data analytics
- Make the students to apply Internet of Things (IoT) data for business solution in various domainin secured manner

UNIT I	INTRODUCTION	9 Hours

Cognitive IoT - Need for Cognitive IoT- Current and Future trends of IoT - Cognitive computing and applications.

UNIT II	DATA ANALYTICS OF COGNITIVE IOT	9 Hours

Data Analytics for IoT Regression - Data Analytics for IoT ANN Classification - Data Analytics for IoT Modern DNN's.

UNIT III	CLOUD AND EDGE COMPUTING IN IOT	9 Hours

Decentralized Computing - Cloud computing - Cloudlets and fog computing - Cloud and edge computing for large scale IoT applications.

UNIT IV	GPU AND FPGA FOR INTERNET OF THINGS	9 Hours

Introduction to GPU's Parallel programming for GPU - Parallel programming in CUDA – CNN Inference in GPU - CNN Training in GPU - Benefits of FPGA - Interfacing FPGAs with IoT-based edge devices - IoT-FPGA based applications - Microsemi's SmartFusion2 SoC FPGA.

UNIT V	IOT ENABLING TECHNOLOGIES AND DEVICES	9 Hours

Big data, Digital twin - Cloud Computing – Sensors – Communications - Analytical software - Edge Devices.

Course Outcome:

1. Integrate the aspects of human cognitive processes in the system design
2. Comprehend the underlying cognitive process can have many abstractions of a cognitive cycle such as 'Sense', 'Understand', 'Decide' and 'Act'.
3. Detect any failures of system components and re-configure itself which provides a graceful degradation through self-healing.
4. Accomplish knowledge about the application, system architecture, resources, system state and behavior
5. Incorporate recent advancements in the machine learning including deep learning in IOT
6. Analyze security issues in IoT applications

Text Books:

- Alessandro Bassi, Martin Bauer, Martin Fiedler, Thorsten Kramp, Rob van Kranenburg, Sebastian Lange and Stefan Meissner, Enabling things to talk –Designing IoT solutions with the IoT Architecture Reference Model, 1st edition ,Springer Open, 2016

- Matin, Mohammad Abdul, ed. Towards Cognitive IoT Networks, 1st edition ,Springer International Publishing, 2020.

Reference Books:

- Arshdeep Bahga and Vijay Madisetti, Cloud Computing: A Hands-on Approach, 1st edition, CreateSpace Independent Publishing Platform, 2013.

- John Mutumba Bilay, Peter Gutsche, Mandy Krimmel and Volker Stiehl, SAP Cloud Platform Integration: The Comprehensive Guide, 2nd edition, Rheinwerg publishing.2019.

- Mahalle, Parikshit Narendra, and Poonam N. Railkar, Identity management for internet of things, 1st edition , River Publishers, 2015.