CP5083   **INTERNET OF THINGS**   **L T P C**
                                                                                                          3 0 2 4

OBJECTIVES:
- To understand the different architectures for IoT.
- To learn various protocols at the different layers for IoT.
- To develop prototype systems using Arduino / Rasberry Pi.
- To apply the use of data analytics in IoT.
- To develop applications of IoT in Industrial contexts.

UNIT I   ARCHITECTURES AND MODELS   9+6
Introduction to IoT – IoT Architectures – Core IoT Functional Stack, Sensors and Actuators Layer, Communications Network Layer, Applications and Analytics Layer – IoT Data Management and Compute Stack, Fog Computing, Edge Computing, Cloud Computing – Sensors, Actuators, Smart Objects, Sensor networks.

UNIT II   CONNECTIVITY   9+6
Communications Criteria – Access Technologies – IP as IoT Network Layer – Business case – Optimization – Profiles and compliances – Application Protocols – Transport Layer – Application Transport Methods.

UNIT III   SYSTEM DEVELOPMENT   9+6
Design Methodology – Case study – Basic blocks of IoT device – Raspberry Pi – Board, Interfaces, Linux, Setting up, Programming – Arduino – Other IoT Devices.

UNIT IV   DATA ANALYTICS AND IoT SECURITY   9+6
Data Analytics for IoT – Big Data Analytics Tools and Technology – Edge Streaming Analytics – Network Analytics, Applications. Security history, challenges, variations – Risk Analysis Structures – Application in Operational Environment.

UNIT V   IoT IN INDUSTRY   9+6
Manufacturing, Architecture, Protocols – Utilities, Grid Blocks - Smart Cities, Architecture, Use cases – Transportation, Architecture, Use cases.

                                                                              TOTAL: 45+30 =75 PERIODS
OUTCOMES:
Upon completion of the course, the student will be able to
- Explain the underlying architectures and models in IoT.
- Analyze different connectivity technologies for IoT.
- Develop simple applications using Arduino / Raspberry Pi.
- Apply data analytics techniques to IoT.
- Study the needs and suggest appropriate solutions for Industrial applications.

REFERENCES:
1. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry, "IoT Fundamentals: Networking Technologies, Protocols and Use Cases for Internet of Things", Cisco Press, 2017
2. Olivier Hersent, David Boswarthick, Omar Elloum, "The Internet of Things – Key applications and Protocols", Wiley, 2012.
3. Michael Miller, "The Internet of Things", Pearson Education, 2015.
4. Arshdeep Bahga, Vijay Madisetti, "Internet of Things – A hands-on approach", Universities Press, 2015.
5. Jan Ho¨ ller, VlasiosTsiatsis, Catherine Mulligan, Stamatis , Karnouskos, Stefan Avesand. David Boyle,"From Machine - to-Machine to the Internet of Things - Introduction to a New Age of Intelligence", Elsevier, 2014.
6. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), "Architecting the Internet of Things", Springer, 2011.

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CP5072   **ADVANCED SOFTWARE ENGINEERING**   **L T P C**
                                                              3 0 2 4

OBJECTIVES :
- Comprehend the different stages of Software Development Lifecycle.
- Comprehend the Process of developing Analysis models and map the Analysis models to Design Models.
- Comprehend the Design Issues related to Web applications and Mobile Apps.
- Comprehend the Quality Factors associated with Software Development.
- Comprehend the use of different Testing Strategies in Software Development.

UNIT I   PROCESS MODELS   9+6
Prescriptive process models – Specialized process models –The Unified Process – Personal and Team Software process – Product and Process – Agile development – Extreme Programming – Other Agile process models – Human aspects of Software Engineering

UNIT II   REQUIREMENTS MODELING AND DESIGN CONCEPTS   9+6
Understanding Requirements–Scenario based methods–Class based methods–Behavior, Patterns and Web/Mobile Apps – Design Process – Design concepts – Design Model

UNIT III   SOFTWARE DESIGN   9+6
Architectural design–Component level Design–User Interface Design–Pattern based design–Web App design– Mobile App design

UNIT IV   SOFTWARE QUALITY   9+6
Garvin's Quality dimensions–McCall's Quality factors–ISO9126 Quality factors – Software Quality Dilemma – Achieving Software Quality–Review Techniques–Elements of Software Quality Assurance–SQA Processes and Product Characteristics–SQA Tasks, Goals, and Metrics–Statistical Software Quality Assurance–Software Reliability–The ISO 9000 Quality Standards–SQA Plan