

ECE128:INTRODUCTION TO IOT NETWORKING PROTOCOLS

L:3 T:0 P:0 Credits:3

Course Outcomes: Through this course students should be able to

CO1 :: understand the concepts of network configuration, topologies and hardware

CO2 :: describe the objectives, architecture and protocols of IoT

CO3 :: discuss the fundamentals of IoT layers and its challenges

CO4 :: analyze the capabilities of IoT communication protocols

CO5 :: evaluate the messaging queues and session light weight protocols for IoT

CO6 :: apply IoT applications for value creations and IOT importance

Unit I

Basics of Networking : data communication, communication networks, protocols and protocols architecture, transmission impairments, layered architecture of computer networks, network types, network models, local and global connectivity, introduction to wireless communication network, OSI and IP/TCP model, MANET architecture

Unit II

Introduction to IoT : network layer, transport layer, application layer, understanding internet of things fundamentals, internet of things architecture and protocols, various platforms for internet of things, real time examples of internet of things, overview of internet of things components and communication technologies, challenges in internet of things, 6LoWPAN adaptation layer, CoSIP protocol and its specification

Unit III

IoT-Design Requirements : message communication protocols for connected devices, websocket, internet of things requirements and challenges, internet of things services and applications, internet of things sensors and antennas, cloud computing and internet of things, software as a service, platform as a service, infrastructure as a service, security issues in the internet of things

Unit IV

IoT Protocols and Security : requirement of protocols, types of protocols, cyber physical systems, the role of authorization, network broker communication, privacy issues in the internet of things, internet of things-OAS application scenarios

Unit V

Messaging Queues and Publish/Subscribe Communications : message queue telemetry transport, MQTT v/s AMQP, session initiation for the internet of things, advantages and disadvantage of the publish/subscribe model

Lightweight Sessions in the IoT : a protocol for constrained session initiation, session initiation, session tear-down, session modification

Unit VI

IoT Applications for Value Creations : future factory concepts, smart objects, smart applications, a protocol for constrained session initiation, near field communication, narrowband IoT, sigfox, introduction to industrial IoT, history of industrial IoT, components of industrial IoT, brownfield internet of things, internet of things in agriculture, internet of things in healthcare

Text Books:

1. DATA COMMUNICATIONS AND NETWORKING by BEHROUZ A. FOROUZAN, MC GRAW HILL

References:

1. INTRODUCTION TO IOT by SUDIP MISRA, ANANDARUP MUKHERJEE, ARIJIT ROY, CAMBRIDGE UNIVERSITY PRESS
2. INTERNET OF THINGS : ARCHITECTURE AND DESIGN PRINCIPLES by RAJ KAMAL, MCGRAW HILL EDUCATION

