

GANPAT UNIVERSITY									
FACULTY OF TECHNOLOGY									
Programme	Bachelor of Technology				Branch/Spec.	Computer Science & Engineering (BDA/CBA/MA)			
Semester	VII				Version	2.0.0.1			
Effective from Academic Year			2018 – 19		Effective for the batch Admitted in			June 2016	
Subject code	2CSE70E16		Subject Name		INTERNET OF THINGS				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	1	0	4	Theory	40	60	100
Hours	3	0	2	0	5	Practical	30	20	50
Pre-requisites:									
Microprocessor and Microcontroller ,Programming , Computer Organization and Architecture									
Learning Outcome:									
After successful completion of this subject students will be able to:									
<ul style="list-style-type: none"> • Understand involved in different aspects of research, implementation, and business with IoT • To learn the fundamentals of this emerging technology. • Understand IoT across different application domain verticals ranging. • Understanding of Sensor Networks and Machine-to-Machine Communications • Understanding of Sensor Networks and Communication Protocols • Implementation of IOT application with Raspberry Pi. • Understand sensor cloud and its approaches 									
Theory syllabus									
Unit	Content								Hrs
1	Introduction to IoT: Characteristics of IoT,Sensing, Actuation and fundamentals of network.								4
2	Basics of Networking: study about basic networking and topology in networking, different Communication Protocols in IOT, IoT Network Protocol Stack, 6LoWPAN, CoAP , MQTT, Bluetooth Low Energy, Zigbee								10
3	Sensor Networks: study about sensors and wired and wireless sensor network different issues and challenges.								6

4	Machine-to-Machine Communications: Introduction - Definition of M2M, Applications of M2M, Key features of M2M, Architecture and components of M2M, Requirements for M2M, Issues /concerns in M2M, Standardization Efforts for M2M.	6
5	SDN for IoT: A Software-Defined Approach for End-to-end IoT Networking, SDN to support Internet of Things devices	6
6	Sensor-Cloud: Architecture, Applications, and Approaches of sensor-cloud, Layered structure of Sensor-Cloud model	6
7	Case Study: Agriculture, Healthcare, Activity Monit	4

Self-study:

Survey research papers on resent technologies and protocols

Practical content

- Interoperability in IoT and Arduino: Perform blinking, Fading LED by Arduino
- Controlling LED using Bluetooth by Arduino
- Interface GSM Module to Arduino-Send and Receive SMS
- Controlling AC bulb Using Arduino With Relay Module
- Ultrasonic Range Sensor on the Raspberry Pi
- Monitor your lab temperature using your Raspberry Pi
- PIR Motion Sensor with Raspberry Pi
- Create Live Weather Station With Arduino and ThingSpeak
- Using Node-RED with your Raspberry Pi, you will learn:
- How to set up Node-RED flows
- How to control GPIO pins with Node-RED
- How to use Node-RED inputs, outputs and a switch (equivalent to a selection statement)
- Using Node-RED to simulate a NOT gate acting upon input from a button
- Simulate 8 motes(sky) with Random positioning use broadcast UDP packets to its neighbors inContikios

Moc Course

Course Name: Introduction to Machine Learning

Link: https://onlinecourses.nptel.ac.in/noc18_cs40

Text Books

1	"The Internet of Things: Enabling Technologies, Platforms, and Use Cases", by Pethuru Raj and Anupama C. Raman (CRC Press)
2	"Internet of Things: A Hands-on Approach", by ArshdeepBahga and Vijay Madiseti (Universities Press)