El 638 - Internet of Things - Syllabus

1. Introduction to internet of things-an overview of Internet of Things, building blocks of IOT, IOT enabling technologies- characteristics of IOT systems and IOT levels.
2. IOT enabling technologies –embedded system-cloud computing –wireless sensor– networks-communication protocols-big data analytics.

3. Embedded Systems- features and constraints of embedded system; Components of embedded systems; interacting with physical world –digital camera case study.

4. Hardware and software – hardware components; microcontrollers and software; operating system.

5. Domain specific IoTs- the characteristics and applications of domain-specific IoTs including home automation, smart environment, smart cities, logistics, retail , smart energy, smart agriculture, industrial control and smart health.

6. Networking and the internet- Networking Basics; Internet Protocol; network layers and MANETS- IOT and M2M- the differences between and IOT and M2M and applications of SDN and NFV in IOT. IoT system management with NETCONF-YANG-NETCONF protocol, YANG data modelling language, and an approach for IoT system management using Netopeer tools.

7. IoT Physical Servers & Cloud Offerings-brief introduction to cloud computing-cloud storage models and communication APIs- WAMP- AutoBahn for IoT-Xively Cloud for IoT-Designing a RESTful Web API- Amazon web services for |IoT.

8. Data analytics for IoT –apache hadoop – using hadoop MapReduce for batch data analysis- apache Oozie- apache spark – apache storm- using apache storm for real time data analysis(approaches for collecting and analysing data generated by IoT systems in the cloud.).

9. Tools for IoT- various tools for IoT including Chef, Puppet, NETCONF-YANG and IOT Code Generator.

References :

1. Internet of things – a hands-on approach by Arshdeep Bahaga and Madisetti – university press.
2. Cloud computing technologies by Thomas erl person.
3. Coursera online course – Internet of things and embedded systems.