INTERNET OF THINGS (IoT)

II Group: CSE / IT

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
ACS510	Elective	3	-	-	3	30	70	100
Contact Classes: 45	Tutorial Classes: Nil	Practical Classes: Nil				Total Classes: 45		

OBJECTIVES:

The course should enable the students to:

I. Understand the architecture of Internet of Things and connectedworld.
II. Explore on use of various hardware, communication and sensing technologies to buildIoT applications.
III. Illustrate the real time IoT applications to make smartworld.
IV. Understand challenges and future trends inIoT.

COURSE LEARNING OUTCOMES:

Students, who complete the course, will have demonstrated the ability to do the following:

1. Understand and intuition of the whole process line of extracting knowledge from data aboutthe Internet ofThings.
2. Deep insight in one of the specializations within the network, depending on the study and the choice of the concepts ofIoT.
3. Solid knowledge in a broad range of methods based on design and implementation of IoT innetwork performance, analysis and problem solving with design ofnetworks.
4. Experience in deriving theoretical properties of methods involved inIoT.
5. Design and implementation/modification of methods involved inIoT.
6. Describe what IoT is and the skill sets needed to be a networkanalysis.
7. Use IoT design to carry out basic statistical modeling andanalysis.
8. Motivateand explaintrade-offsinIoTtooltechniquedesignandanalysisofapplications withIoT.
9. Understand significance of models inIoT.
10. Describe the Transport layer protocols and how its uses inIoT.
11. Apply basic IoT algorithms for predictive networkperformance.
12. Understand basic terms what security issues. Identify key distributionmethods.
13. Identify common approaches used for Feature Generation ofIoT.
14. Create effective results of IoT futureapproaches.
15. Work effectively in teams on IoTprojects.

UNIT-I	INTRODUCTION TO INTERNET OF THINGS (IoT)	Classes: 08

Definition and characteristics of IoT, physical design of IoT, logical design of IoT, IoT enabling technologies,IoTlevelsanddeployment,domainspecificIoTs.

UNIT-II	IoT AND M2M	Classes: 10

Introduction, M2M, difference between IoT and M2M, software defined networking (SDN) and network function virtualization (NFV) for IoT, basics of IoT system management with NETCONF-YANG.

UNIT-III	IoT PLATFORMS DESIGN METHODOLOGY	Classes: 10
IoT Architecture: State of the art introduction, state of the art; Architecture reference model: Introduction, reference model and architecture, IoT reference model. Logical design using Python: Installing Python, Python data types and data structures, control flow, functions, modules, packages, file handling.		
UNIT-IV	**IoT PHYSICAL DEVICES AND ENDPOINTS**	**Classes: 08**
Introduction to Raspberry Pi interfaces (Serial, SPI, I2C), programming Raspberry PI with Python, other IoT devices.		
UNIT-V	**IoT PHYSICAL SERVERS AND CLOUD OFFERINGS**	**Classes: 09**
Introduction to cloud storage models and communication APIs, WAMP – AutoBahn for IoT, Xively cloud for IoT, case studies illustrating IoT design – home automation, smart cities, smart environment.		

Text Books:

1. Arshdeep Bahga, Vijay Madisetti, "Internet of Things: A Hands-on-Approach", VPT, 1st Edition, 2014.
2. Matt Richardson, Shawn Wallace, "Getting Started with Raspberry Pi", O'Reilly (SPD), 3rd Edition, 2014.

Reference Books:

1. Adrian McEwen, Hakim Cassimally, "Designing the Internet of Things", John Wiley andSons2014.
2. Francis daCosta, **"**Rethinking the Internet of Things: A Scalable Approach toConnecting Everything", Apress Publications,1st Edition2013.

Web References:

1. https://www.upf.edu/pra/en/3376/22580.
2. https://www.coursera.org/learn/iot.
3. https://bcourses.berkeley.edu.
4. www.innovianstechnologies.com.

E-Text Books:

1. https://mitpress.mit.edu/books/internet-things
2. http://www.apress.com