IoT WITH PHYTHON PROGRAMMING

VII Semester: CSE / IT

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
ACS806	Value added Course-I	-	-	-	-	-	-	-
Contact Classes:	Tutorial Classes: Nil	Practical Classes: Nil						

OBJECTIVES:

The course should enable the students to:

I. Understand the architecture of Internet of Things and connected world.
II. Explore on use of various hardware and sensing technologies to build IoT applications.
III. Illustrate the real time IoT applications to make smart world.
IV. Understand the available cloud services and communication API‘s for developing smart cities.

COURSE OUTCOMES (COs):

I. Understand the concept of Internet of Things and connected world.
II. Explore on use of various hardware and sensing technologies to build IoT applications
III. Illustrate the architecture of Internet of Things and python.
IV. Understand the working with python on intel galileo gen.
V. Explore on Interacting with digital outputs with python.

COURSE LEARNING OUTCOMES (CLOs):

1. Understand and intuition of the whole process line of extracting knowledge from data about the Internet of Things.
2. Deep insight in one of the specializations within the network, depending on the study and the choice of the concepts of IoT..
3. Solid knowledge in a broad range of methods based on design and implementation of IoT in network performance, analysis and problem solving with design of networks.
4. Experience in deriving theoretical properties of methods involved in IoT..
5. Design and implementation/modification of methods involved in IoT.
6. Describe what IoT is and the skill sets needed to be a network analysis.
7. Use IoT design to carry out basic statistical modeling and analysis.
8. Motivate and explain trade-offs in IoT tool technique design and analysis of applications with IoT.
9. Understand significance of models in IoT.
10. Describe the Transport layer protocols and how its uses in IoT
11. Apply basic IoT algorithms for predictive network performance.
12. Understand basic terms what security issues. Identify key distribution methods
13. Identify common approaches used for Feature Generation of IoT.
14. Create effective results of IoT future approaches
15. Work effectively in teams on IoT projects.

UNIT-I INTRODUCTION TO INTERNET OF THINGS (IoT)

Definition and characteristics of IoT, physical design of IoT, logical design of IoT, IoT enabling technologies, IoT levels and deployment, domain specific IoTs.

UNIT -II	IoT AND M2M
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 ARCHITECTURE AND PYTHON**
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	**WORKING WITH PYTHON ON INTEL GALILEO GEN**
Setting up the board to work with Python as the programming language, Retrieving the board's assigned IP address, Connecting to the board's operating system, Installing and upgrading the necessary libraries to interact with the board, Installing pip and additional libraries, Invoking the Python interpreter.	
UNIT -V	**INTERACTING WITH DIGITAL OUTPUTS WITH PYTHON**
Turning on and off an onboard component, Prototyping with breadboards, Working with schematics to wire digital outputs, Counting from 1 to 9 with LEDs, Python code and the mraa library, Taking advantage of object-oriented code to control digital outputs, Improving our object-oriented code to provide new features, Isolating the pin numbers to improve wirings, Controlling digital outputs with the wiring-x86 library.	
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 and Sons, 1st Edition, 2014.	
Web References:	
1. https://www.udemy.com/python-for-iot-tutorials/ 2. https://www.coursera.org/specializations/iot 3. https://www.quora.com/What-is-the-use-of-python-in-IOT	
E-Text Books:	
1. https://www.oreilly.com/library/view/internet-of-things/9781785881381/	