1. Course Number and Title: IOT 4111 - Introduction to Internet of Things

2. Credit Hours: 3 (Three)

3. Course Description:

Internet of Things (IoT) is presently a hot technology worldwide. Government, academia, and industry are involved in different aspects of research, implementation, and business with IoT. IoT cuts across different application domain verticals ranging from civilian to defence sectors. These domains include agriculture, space, healthcare, manufacturing, construction, water, and mining, which are presently transitioning their legacy infrastructure to support IoT. Today it is possible to envision pervasive connectivity, storage, and computation, which, in turn, gives rise to building different IoT solutions. IoT-based applications such as innovative shopping system, infrastructure management in both urban and rural areas, remote health monitoring and emergency notification systems, and transportation systems, are gradually relying on IoT based systems. Therefore, it is very important to learn the fundamentals of this emerging technology.

1. **Objectives** :
   The objectives of this course are given below.

   To help the students
   a. Explain in a concise manner how the general Internet as well as Internet of Things work.
   b. Understand constraints and opportunities of wireless and mobile networks for Internet of Things.
   c. Use basic measurement tools to determine the real-time performance of packet based networks.
   d. Able to realize the revolution of Internet in Mobile Devices, Cloud & Sensor Network

5. Course Content :

Course Content	Number of Classes	Learning Outcomes	Instructional Techniques	Assessment Technique
Unit 01. Internet in general and Internet of Things: layers, protocols, packets, services, Performance parameters of a packet network as well as applications such as web, Peer-to-peer, sensor networks, and multimedia.	5	After complete this unite student will be able to understand protocols and layers of different models.		Class quiz Question answer Presentation

Course Content	Number of Classes	Learning Outcomes	Instructional Techniques	Assessment Technique
Unit 02.Transport services: TCP, UDP, socket programming. Declaration, statement	5	After complete this unite student will be able to understand about socket programming.		
Unit 03. Local Area Networks: MAC level, link protocols such as: point-to-point protocols, Ethernet, WiFi 802.11, cellular		After complete this unite student will be able to		

Internet access, and Machine-to-machine	4	understand about LAN.		
Unit 04. Mobile Networking: Roaming and handoffs, mobile IP, and ad hoc and infrastructure less networks.	4	After complete this unite student will be able to understand about Mobile Cellular Network.		Class quiz Question answer Presentation
Unit 05. Introduction & Concepts: Introduction to Internet of Things, Introduction to Arduino Programming, Brief History and evolution of IOT, Physical Design of IOT, Logical Design of IOT, IOT Enabling Technologies, IOT Levels.	6	After complete this unite student will be able to understand basics of IOT.		
Unit 06.Domain Specific IOTs: Home Automation, Cities, Environment, Energy, Retail, Logistics, Agriculture, Industry, Health & Life Style, Cloud Computing.	4	After complete this unite student will be able to understand about Domain Specific IOT.		
Unit 07. Developing Internet of Things & Logical Design using Python: Introduction, IOT Design Methodology, Installing Python, Python Data Types & Data Structures, Control Flow, Functions, Modules, Packages, File Handling, Date/ Time Operations, Classes, Python Packages	8	After complete this unite student will be able to understand about basic Python.		
Unit 08: IOT Physical Devices & Endpoints: What is an IOT Device, Exemplary Device, Board, and Linux on Raspberry Pi, Interfaces, and Programming & IOT Devices.	6	After complete this unite student will be able to understand about IOT Physical Devices & Endpoints.		

Assignments

References Book:

1. Vijay Madisetti, Arshdeep Bahga," Internet of Things A Hands-On- Approach"
2. Adrian McEwen, "Designing the Internet of Things", Wiley Publishers