ELECTRICAL ENGINEERING

Design for Internet of Things

Type of Course	:	New
Course Snapshot	:	Elective / PG
	:	Practicing professional, System Designers
Pre-requisites	:	Computer Network Basics
Course Duration	:	20 hours / 8 weeks

COURSE OUTLINE:

A high level view of IOTs, design of smart objects that provide collaboration and ubiquitous services will be explored. Design for longevity/energy efficiency will be highlighted. Step by step system design will be introduced. Small video chips that will allow students to prototype will be displayed. At the end of the course, the student is expected to make the right choice of hardware, software and protocols for the proposed application

INSTRUCTOR:

Prof. T V Prabhakar
Department of Electronic Systems Engineering
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ABOUT INSTRUCTOR:

Prof. Prabhakar Venkata works as Principal Research Scientist in the Department of Electronic Systems Engg, IISc, Bangalore. His area of work is in Networked Embedded Systems. His research interest is in Energy Harvesting and Power Management Algorithms for sensor networks. The broad spectrum comprises of Modelling, Virtual Prototyping, System Building and Performance evaluation. His current work in LED based communication won the best demo award in COMSNETS 2014. He is currently working on energy harvesting technologies in chip design, indoor localization applications, and other battery less applications.

COURSE PLAN:

Week 1 : Introduction to IOTs - Improving Quality of Life
Week 2 : Challenges to solve in IOTs - Energy / Power, Data Explosion, Security
Week 3 : System design of an IOT System - Power supply, Processor, Memory Sensor Interface
Week 4 : Wireless Interfaces - LAN - BLE, Wi-Fi, RFID, LP WAN - LORA, LTE-M, Sigfox, NB-IOT
Week 5 : Power supply design - LDOs, Switching regulators - BuckBoost Converters,Energy Measurements
Week 6 : Energy harvesting and battery life calculation - PV, RF , Kinetic Energy, TEGs, aeroelastic flutter, Harvesting ICs in silicon
Week 7 : Protocols - IoT MAC, REST based COAP, Publish subscribe- MQTT, AMQP, MDNS
Week 8 : Building an IOT System - Case Studies -Joule Jotter, Chhaya.