Lesson Plan

CSE 1105E6: IOT Applications and

Communication Protocols

Course Instructor: Abhishek Majumber, Department of Computer Science & Engineering, Tripura University

Faculty	Topics	Contact Hours	Contact Occurred On	Remark
Mr. A. Majumder	***Introduction and Applications: smart transportation, smart cities, smart living, smart energy, smart health, and smart learning.***	3		
	Basic function and architecture of a sensor — sensor body, sensor mechanism, sensor calibration, sensor maintenance, cost and pricing structure, legacy and modern sensor network.	3		
	Development of sensor electronics — IoT vs legacy, and open source vs traditional PCB design style	2		
	Development of sensor communication protocols, Protocols: Modbus, relay, Zigbee, Zwave, X10,Bluetooth, ANT, etc.	5		
	Business driver for sensor deployment — FDA/EPA regulation, fraud/tempering detection, supervision, quality control and process management	4		
	Different kind of calibration Techniques: manual, automation, infield, primary and secondary calibration — and their implication in IoT	2		
	Powering options for sensors: battery, solar, Witricity, Mobile and PoE Zigbee and Zwave — advantage of low power mesh networking. Long distance Zigbee. Introduction to different Zigbee chips.	3		
	Bluetooth/BLE: Low power vs high power, speed of detection, class of BLE. Introduction of Bluetooth vendors & their review. Wireless protocols such as Piconet and packet structure for BLE and Zigbee	5		

	Other long distance RF communication link. LOS vs NLOS links, Capacity and throughput calculation			
	Application issues in wireless protocols:power consumption, reliability, PER, QoS, LOS. PCB vs FPGA vs ASIC design. Prototyping electronics vs Production electronics. QA certificate for IoTCE/CSA/UL/IEC/RoHS/IP65.	3		
	Basic introduction of multi-layer PCB design and its workflow Electronics reliability-basic concept of FIT and early mortality rate Environmental and reliability testing-basic concepts Basic Open source platforms: Arduino, Raspberry Pi, Beaglebone	3		
	Introduction to Mobile app platform for IoT: Protocol stack of Mobile app for IoT, Mobile to server integration, iBeacon in IoS, Window Azure, Linkafy Mobile platform for IoT, Axeda, Xively	3		
	Database implementation for IoT : Cloud based IoT platforms, SQL vs NoSQL, Open sourced vs. Licensed Database, Available M2M cloud platform, AxedaXively, Omega NovoTech, Ayla Libellium, CISCO M2M platform, AT&T M2M platform, Google M2M platform. Recent trends in home automation, IOT-locks, Energy optimization in home	4		
Grand Total		**40**		