GUJARAT TECHNOLOGICAL UNIVERSITY

Subject Name: Wireless Technology for Embedded Systems
Subject Code: 3725207

Semester II

Type of course: ME - Electronics & Communication Engineering (VLSI & Embedded Systems Design)

Prerequisite: none

Rationale: NA

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE (E)	PA (M)	ESE(V)	PA (I)	
4	2#	0	5	70	30	30	20	150

L- Lectures; T- Tutorial/Teacher Guided Student Activity; P- Practical; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment;

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Review of C Programming, Data Structures , Introduction to UML , Software Life Cycle Models , Embedded Systems Design, Implementation and Testing , Overview of Networking and Packet Switching Concepts, OSI Reference Model and TCP/IP Protocol Suite, LAN Protocol Suite	6	10
2	Evolution of Wireless Communication - Radio architectures: TRF, single conversion, and dual conversion, and IQ; Modulation - AM, FM, SSB, TDMA, CDMA, OFDM, QPSK; PLL – phase lock loops, Wireless Standards – IS136, IS95, 802.11(a-g), GSM, 3G, WiMax, Antennas and Propagation with an introduction to the Smith Chart	6	10
3	Embedded Systems – Hardware, Software, Internet Access; Development and Debugging Tools - Simulators, ICE, C Compiler; RTOS – System Services, Interrupt Handling, Real Time, Scheduling; Socket Programming – Internet Architecture, UDP, TCP, client/server; Internet Application Protocols – HTTP, FTP, SNMP, Audio/Video Applications	6	10
4	Embedded systems hardware and software interfaces; Protocol Debugging & Testing Tools – PING, Sniffers, Load Generators; Development tools – SDK, simulators, debuggers; TCP/IP – architecture, socket programming and debugging	7	20
5	Wireless Technologies and Mobile Programming - Wireless LAN : 802.11 & WiMAX, RFID & Bluetooth, GSM & GPRS, Mobile Development Platforms (Android, Symbian, OpenMoko, J2ME), Bluetooth – architecture, protocols, implementation, and programming API; WiFi – architecture, protocols, implementation, and API; ZigBee – architecture, protocols, implementation, and API	7	20

Course Outcome:

1. After learning the course the students should be able to:
2. Explain the process of embedded software design and networking.
3. Describe various wireless technologies and its standard.
4. Explain various embedded software tools and develop network programs.
5. Enumerate different types of network protocol testing tools and use them.
6. Describe the wireless technologies that are used in embedded systems and mobile platforms and develop mobile applications.

List of Experiments: (with Open Ended Problems)

1. Experiments with wireshark ethernet packet sniffer.
2. Java application development for android platforms**.**

Major Equipments:

1. Latest android mobile

List of Open Source Software/learning website:

1. Sdk
2. Jdk
3. netBeans/eclipse

Review Presentation (RP): The concerned faculty member shall provide the list of peer reviewed Journals and Tier-I and Tier-II Conferences relating to the subject (or relating to the area of thesis for seminar) to the students in the beginning of the semester. The same list will be uploaded on GTU website during the first two weeks of the start of the semester. Every student or a group of students shall critically study 2 papers, integrate the details and make presentation in the last two weeks of the semester. The GTU marks entry portal will allow entry of marks only after uploading of the best 3 presentations. A unique id number will be generated only after uploading the presentations. Thereafter the entry of marks will be allowed. The best 3 presentations of each college will be uploaded on GTU website