



# GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Engineering Syllabus

Subject Code : 3720405

Subject Name : Embedded Wireless Systems

WEF Academic Year :	2023 - 24
Semester :	2
Category of the Course :	Program Elective

<b>Prerequisite :</b>	Fundamental knowledge of Wireless and digital Communication.
<b>Rationale :</b>	This Subject Provide the students an exposure to understand wireless communication technology and learn how to implement it on embedded platform. It also helps the students to develop their own project or carried our dissertation work on embedded wireless application. This subject provides the opportunity to the student to understand real environment problem in wireless communication and motivate them to bring out with the solution by practically implementing application.

## Course Scheme :

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Practical		
				ESE (E)	PA(M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

## Course Content :

Sr. No.	Course Content	No. of Hours
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 .	12
2	Evolution of Wireless Communication - Radio architectures: TRF, single conversion, and dual conversion, Super-heterodyne receiver, IQ; Modulation - AM, FM, SSB, TDMA, CDMA, FDMA, OFDM, BPSK, QPSK, M-QAM; PLL – phase lock loops, Wireless Standards – IS136, IS95, 802.11(a-g), GSM, 3G, WiMax, Small Scale and large scale fading.	12
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	12



# GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Engineering Syllabus

Subject Code : 3720405

Subject Name : Embedded Wireless Systems

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	6
5	Wireless Technologies and Mobile Programming - Wireless LAN : 802.11 & WiMAX, RFID & Bluetooth, GSM & GPRS, MIMO 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.	6
<b>Total</b>		<b>48</b>

## Suggested Specification table with Marks (Theory) :

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
<b>10</b>	<b>20</b>	<b>30</b>	<b>20</b>	<b>10</b>	<b>10</b>

**Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)**

**Note :** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## Reference Book :

1. Embedded Systems and Wireless Technology: Theory and Practical Applications, Raul A. Santos, CRC Press
2. Embedded Systems and Wireless Technology: Theory and practical applications by Dr. Raúl Aquino santos, MSc. Arthur Edwards Block (University of Colima, Mexico)
3. Fundamentals of Mobile and Pervasive Computing by Frank Adelstein, Sandeep K.S. Gupta, Golden G. Richard III, and Loren Schwiebert, Publisher: McGraw-Hill Education, 2005, ISBN-10:0071412379, ISBN-13: 978-0071412377.
4. Context-Aware Pervasive Systems: Architectures for a New Breed of Applications by Seng Loke, Publisher: AUERBACH, 1st edition (December 7, 2006), ISBN-10: 0849372550, ISBN-13: 9780849372551
5. Cooperating Embedded Systems and Wireless Sensor Networks by Michel Banatre (Editor), Pedro Jose Marron (Editor), AnibalOllero (Editor), Adam Wolisz (Editor)



# GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Engineering Syllabus

Subject Code : 3720405

Subject Name : Embedded Wireless Systems

---

## Course Outcome :

After Completion of the Course, Student will able to :

No.	Course Outcomes	Weightage %
01	Design a API using Embedded technology.	20
02	Analyze the performance of various embedded system.	30
03	Evaluate the performance of various protocols communication standards and wireless.	20
04	Understand the process of embedded software design and networking.	30

\*\*\*\*\*