

## GUJARAT TECHNOLOGICAL UNIVERSITY

**SUBJECT NAME: Mobile Communication Technologies (Elective III & IV- Group 2)**

**SUBJECT CODE: 3725305**

**Semester II**

**Type of course:** ME - Computer Engineering (Wireless And Mobile Computing)

**Prerequisite:** GSM Architecture Knowledge

**Rationale:** NA

**Teaching and Examination Scheme:**

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE(V)	PA (I)	
3	2#	0	4	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	The Cellular Engineering Fundamentals: Cell Concept Frequency Reuse, Channel Assignment Strategies: Fixed Channel Assignment (FCA), Dynamic Channel Assignment (DCA), Handoff Process: Factors Influencing Handoffs, Handoffs in Different Generations, Handoff Priority, A Few Practical Problems in Handoffs Enhancing Capacity and Cell Coverage: The key Trade-offs, Cell-Splitting, Sectoring, Microcell Zone Concept	5	10
2	Modern Wireless Communication Systems 1G: First Generation Networks, 2G: Second Generation Networks: TDMA/FDD Standards, CDMA/FDD Standard, 2.5G Mobile Networks, 3G: Third Generation Networks, 3G Standards and Access Technologies, 3G W -CDMA (UMTS)	5	10
3	Case Study based on above concepts: (GSM) GSM System Architecture, Radio Interface, Protocols, Localization and calling, Handover, Data Services: GPRS	4	10
4	Mobile IP: Node mobility and IP, Mobile IP, Foreign agent discovery, Home agent registration, Packet delivery through tunnelling and encapsulation, Route optimization	5	10
5	Mobile Transport Layer: Tradition TCP and its unsuitability: Flow control, Congestion avoidance, slow start, and retransmission, TCP Reno and TCP Vegas Classical TCP Improvements in wireless networks: Indirect TCP, Snoop TCP, Mobile TCP, Transaction oriented TCP, TCP over 2.5G/3G	6	10
6	Designing Applications over Mobile Environment: Issues and Challenges Traditional Abstractions and their problems: Message Passing, Remote Invocations, Notifications, Shared spaces, Message Queuing.	6	10

7	The Implicit Invocation Paradigm (Publish/Subscribe) The P2P Paradigm and its usage in Mobile environment Case Study based on above concepts: Data dissemination in VANET (Vehicular Ad-hoc Network)	5	10
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**Text Book:**

1. J. Schiller, Mobile Communications, Addison –Wesley, 2003

**Reference Book:**

1. Mobile and Wireless Design Essentials by Martyn Mallick, John Wiley & Sons

**Course Outcome:**

After learning the course the students should be able to:

1. The Mobile Communications Technology program is designed to help students develop knowledge and skills that they can use to prepare for career opportunities in a variety of entry-level positions in the field of mobile communications technology, such as field technicians, field service specialist, mobile devices support consultant, applications development technician and wireless technician.
2. The program teaches analog and digital electronics, computers and networking, electronic and digital communications systems, and mobile wireless communications systems and devices.
3. The program also exposes students to a combination of classroom theory and practical application in a laboratory environment.

**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