



Kadi Sarva Vishwavidyalaya
Faculty of Engineering & Technology
Fourth Year Bachelor of EC Engineering
 (VIIth Sem Academic Year 2020)

Subject Code: EC702-N	Subject Title: Wireless and Mobile Communication
------------------------------	---

Course Objective:

The educational objectives of this course are

- To present a problem oriented introductory knowledge of Wireless communication and to present their applications in various areas of wireless domain.
- To address the underlying concepts and methods of Wireless and mobile communication area.

Teaching scheme				Total Credit	EvaluationScheme					Total Marks
L	T	P	Total		Theory		IE Marks	CIA Marks	Pract. Marks	
Hrs	Hrs	Hrs	Hrs		Hrs	Marks				
04	00	02	06	05	03	70	30	20	30	150

Outline Of the Course:

Sr. No	TitleoftheUnit	Minimum Hours
1	Background of Wireless Communication System	04
2	The Cellular Basics - System Design Fundamentals	14
3	Mobile Radio Propagation Model, Small Scale Fading and diversity	12
4	Multiple Access Techniques	08
5	Wireless Systems and Technology	14
6	Latest Developed trends	08
	Total	60

Total hours (Theory): 60

Total hours (Lab):

Total hours: 60



Kadi Sarva Vishwavidyalaya
Faculty of Engineering & Technology
Fourth Year Bachelor of EC Engineering
 (VIIthSem Academic Year 2020)

Detailed Syllabus

Sr. No	Course Content	Total Hrs.
1.	Background of Wireless Communication System: Evolution of mobile communications, Mobile Radio System around the world, Types of Wireless communication System, Comparison of Common wireless system, Trend in Cellular radio and personal communication. Second generation Cellular Networks, Third Generation (3G) Wireless Networks, Wireless Local Loop (WLL), Wireless Local Area network (WLAN), Bluetooth and Personal Area Networks.	04
2.	The Cellular Basics - System Design Fundamentals: Cellular system, Hexagonal geometry cell and concept of frequency reuse, Channel Assignment Strategies Distance to frequency reuse ratio, Channel & co-channel interference reduction factor, S/I ratio consideration and calculation for Minimum Co-channel and adjacent interference, Handoff Strategies, Umbrella Cell Concept, Trunking and Grade of Service, Improving Coverage & Capacity in Cellular System-cell splitting, Cell sectorization, Repeaters, Micro cell zone concept, Channel antenna system design considerations.	14
3.	Mobile Radio Propagation Model, Small Scale Fading and diversity: Large scale path loss:-Free Space Propagation loss equation, Path-loss of NLOS and LOS systems, Reflection, Ray ground reflection model, Diffraction, Scattering, Link budget design, Max. Distance Coverage formula, Empirical formula for path loss, Indoor and outdoor propagation models, Small scale multipath propagation, Impulse model for multi path channel, Delay spread, Feher's delay spread, upper bound Small scale, Multipath Measurement parameters of multipath channels, Types of small scale Fading, Rayleigh and rician distribution, Statistical for models multipath fading channels and diversity techniques in brief.	12
4.	Multiple Access Techniques: Introduction, Comparisons of multiple Access Strategies TDMA, CDMA, FDMA, OFDM, CSMA Protocols	08
5.	Wireless Systems and Technology GSM system architecture, Radio interface, Protocols, Localization and calling, Handover, Authentication and security in GSM, GSM speech coding, Concept of spread spectrum, Architecture of IS-95 CDMA system, Air interface, CDMA forward channels, CDMA reverse channels, Soft handoff, CDMA features, Power control in CDMA, Performance of CDMA system, RAKE Receiver, CDMA 2000 cellular technology, GPRS system architecture.	14
6.	Latest Developed trends: Introduction to Wi-Fi, WiMAX, ZigBee Networks, Software Defined Radio, UWB Radio, Wireless Adhoc Network and Mobile Portability, Security issues and challenges in a Wireless network.	08



Kadi Sarva Vishwavidyalaya
Faculty of Engineering & Technology
Fourth Year Bachelor of EC Engineering
(VIIthSem Academic Year 2020)

Instructional Method and Pedagogy:

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed
- Lecture may be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lectures, practicals and Tutorial which carries 05 Marks.
- At regular intervals assignments is given. In all, a student should submit all assignments of 05 marks each.
- Classroom participation and involvement in solving the problems in Tutorial rooms carries 05 Marks.
- Viva Voce will be conducted at the end of the semester of 05 Marks.
- One internal exam of 30 marks is conducted as a part of Mid semester evaluation.
- Experiments shall be performed in the laboratory related to course contents.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concept being taught in lectures.

Learning Outcome:

On successful completion of the course

- The student can identify different area of Cellular Basics, Multiple Access Techniques and Background of Wireless Communication System also the different applications in wireless communication.

TEXT & REFERENCE BOOKS:

1. "Wireless Communication", Theodore S. Rappaport, Prentice hall
2. "Wireless Communications and Networking ", Vijay Garg, Elsevier
3. 'Wireless digital communication', KamiloFeher, PHI
4. "Mobile Communications Engineering", William C. Y. Lee, Mc Graw Hill Publications
5. Mobile and personal Communication system and services by Rajpandya, IEEE press(PHI).
6. Wireless Communications-T.L.Singh-TMH
7. Adhoc Mobile Wireless network, C.K.Toh Pearson

LIST OF EXPERIMENTS

Sr. No.	Experiment Title
1.	To Perform Scale reading on Spectrum Analyzer 8010/8010G
2.	To Analyze Uplink and Downlink Frequency in Spectrum Analyzer 8010/8010G.
3.	To Perform Gaussian and Rayeight Distribution and plot their results.
4.	To Analyze the Effect of AWGN for Sinusoidal Signal.
5.	To configure and perform the 80 command on GSM Kit with dual band operation.



Kadi Sarva Vishwavidyalaya
Faculty of Engineering & Technology
Fourth Year Bachelor of EC Engineering
(VIIthSem Academic Year 2020)

6.	To Perform CDMA communication with PN series.
7.	To Perform Zig Bee setup with narrow band signal.
8.	To Measure WGN in Digital modulation.
9.	To Perform ADHOC network routing scheme.
10.	To Perform Hata Propagation for urban area.