GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. Signal Processing and Communication

Semester: I

Subject Name: **Modern Digital and Wireless Communication**

Subject Code: **714102**

Sr. No.	Course Content
1	**Random Variables and Processes** Probability, Random variables, Useful probability Density Function, Random processes, Noisy channel and role of repeater, Pulse amplitude modulation and concept of time division multiplexing, Pulse width Modulation and pulse position Modulation, Digital representation of Analog Signal, Differential Pulse Code Modulation and Delta Modulation
2	**Overview of Wireless Communication** Roadmap of Cellular Communications, Mobile cellular Networks, Roadmap for wireless networking, Cellular and Multiple user systems.
3	**Propagation Through Channel and Diversity** Propagation Loss, Channel Fading, Doppler fading, WSSUS model, Propagation mechanism, Atmospheric effects, Diversity methods, Combining multiple signals, Transmit Diversity, Multi-user Diversity.
4	**Digital Modulation and Detection** Introduction to Digital Modulation, Baseband Modulation, PAM, PSK, FSK, QPSK, Match filtering, Bandwidth efficiencies of M-ary Modulation, Synchronization, Error probability in fading channel, error probability due to delay spread and frequency dispersion.
5	**Channel Coding** Linear Block Codes, Hard/Soft decision decoding, Cyclic Codes, Interleaving, Convolution Codes, Turbo Codes, Adaptive modulation Coding.
6	**Spread Spectrum Communication** Spreading sequences, Direct sequence spread spectrum,Multiuser detection, Bit error probability and system capacity, other DSSS techniques, recent topics in wireless communication and technology

Reference Books:

1. Ke-Lin Du, M.N.S Swamy, Wireless Communication Systems, Cambridge University Press.
2. David Tse, Pramod Viswanath, Fundamentals of Wireless Communication, Cambridge University Press.
3. Herbert Taub, Donald L Schilling, Gautam saha, Principles of Communication Systems, Tata McGrawHill
4. Proakis J.J.,D Wozencraft J.M. and Jacobs I.M., Principles of Communication Engineering, John Wiley.
5. Todd K. Moon, Error Correction Coding Mathematical Methods and Algorithms, Wiley