GUJARAT TECHNOLOGICAL UNIVERSITY

Signal Processing and VLSI Technology (EC)

M.E. Semester: II

Subject Name: **Digital Speech Signal Processing (Major Elective – II)**

Sr. No.	Course Content	Total Hours
1.	**Mechanics of Speech :** Introduction, Mechanism of speech production, speech sounds, speech perception, Acoustic of speech production, Physics of speech sound, Digital models for speech signals.	9
2.	**Time Domain Speech Processing:** Introduction, Time dependent processing, Linear prediction analysis, Short time homomorphic analysis, short time speech analysis, Analysis Synthesis structure, Homomorphic prediction .	9
3.	**Frequency Domain Speech Processing:** Introduction, Short Time Fourier analysis, Fourier transform, Short time synthesis, phase vocoder, pitch estimation based on correlation, comb filter and harmonic sine wave model.	9
4.	**Speech coding:** Introduction, scalar quantization, vector quantization, frequency domain coding, model based coding, LPC residual coding.	8
5.	**Application of speech signal processing:** Automatic Speech Recognition and algorithms, Feature Extraction for ASR, - Speaker identification and verification.	7

Reference Books:

1. Thomas F. Quatieri, Discrete-Time Speech Signal Processing, Pearson Education.
2. Ben Gold and Nelson Morgan, Speech and Audio Signal Processing, Wiley India.
3. L.R.Rabiner and R.W.Schaffer – Digital Processing of Speech signals, Pearson Education.
4. L. R. Rabiner ,B. H. Juang and B. Yegnanarayana, Fundamentals of Speech Recognition, Pearson Education.
5. D O'shaughnessy, Speech Communication: Human and Machine, Addison Wesley