

(Elective – I)

Speech Processing
B.E. Sem. VII [EXTC]

EVALUATION SYSTEM

	Time	Marks
Theory Exam	3 Hrs.	100
Practical Exam	–	–
Oral Exam	–	25
Term Work	–	25

Objective : To introduce the characteristics of Speech signals and the related time and frequency domain methods for speech analysis.

SYLLABUS

1. Nature of Speech Signals

Speech production mechanism, Classification of speech, sounds, nature of speech signal, models of speech production. Speech signal processing: purpose of speech processing, digital models for speech signal, Digital processing of speech signals.

2. Time Domain Methods for Speech Processing

Time domain parameters of speech, methods for extracting the parameters, Zero crossings, Auto correlation function, pitch estimation.

3. Frequency Domain Methods for Speech Processing

Short time Fourier analysis, filter bank analysis, spectrographic analysis, Format extraction, pitch extraction, Analysis - synthesis systems.

4. Linear Predictive Coding of Speech

Formulation of linear prediction problem in time domain, solution of normal equations, Interpretation of linear prediction in auto correlation and spectral domains.

5. Homomorphic Speech Analysis

Central analysis of speech, format and pitch estimation, Applications of speech processing - Speech recognition, Speech synthesis and speaker verification.

References :

1. Digital processing of speech signals (*Rabiner L. R. and Schafer R.E.*) Prentice Hall, 1978.
2. Signal Processing of Speech (*Owens, F.J.*) Macmillan, 1993.
3. Discrete-Time Processing of Speech Signals (*Deller J.R. Proakis J.G. and Hanson J.H.*) Macmillan.
4. Applied speech and Audio Processing with MATLAB examples (*Ian McLoughlin*) Cambridge University Press 2009.
5. Digital Speech : Coding for Low Bit Rate Communication Systems, 2nd Edition (*A.M. Kondoz*) Wiley.

