Satyug Darshan Institute of Engineering and Technology

Lesson Plan / Teaching Plan / Lecture Plan with Progress: BCA DS – 5th Semester: 2025-26

Course Name (Code) : Speech and Audio Processing (BCG307) Faculty – Ranu Verma

Topics / lectures are arranged in sequence - same - as to be taught in the class. Maintain data related to "Date" in its hard copy.

S. No.	Lecture No	Topic Description	Teaching Pedagogy	Reference Material	Remarks, if any
1	1	Speech Signal Processing	Board	T1	
2	2	Speech production and modelling	Board	T1	
3	3	Human Auditory System	Board	T1	
4	4	General structure of speech coders	Board	T1	
5	5	Speech coding techniques	Board	T1	
6	6	Classification of speech coding techniques – parametric, waveform and hybrid	Board	T1	
7	7	Requirements of speech codecs	Board	T1	
8	8	Requirements of speech codecs –quality, coding delays, robustness	Board	T1, T2	
9	9	Speech Signal Processing	Board	T1	
10	10	Revision			
11	48	Pitch-period estimation	Board	T1	
12	49	All-pole and all-zero filters	Board	T1	
13	50	Convolution; Power spectral density	Board + PPT	T1	
14	51	Periodogram	Board + PPT	T1	
15	52	Autoregressive model	Board + PPT	T1	
16	53	Autocorrelation estimation.	Board	T1	
17	11	Basic concepts of linear prediction	Board	T1	
18	12	Linear Prediction Analysis of non-stationary signals –prediction gain	Board	T1	
19	13	Levinson-Durbin algorithm	Board	T1	
20	14	Long-term linear prediction models	Board	T1	
21	15	Short-term linear prediction models	Board	T1	
22	16	Moving average prediction	Board + PPT	T1	
23	17	Scalar quantization–uniform quantizer	Board	T1	
24	18	Optimum quantizer	Board + PPT	T1, T2	
25	19	logarithmic quantizer	Board	T1,T2	
26	20	Adaptive quantizer	Board	T1, T2	
27	21	Differential quantizers	Board	T1	
28	22	Vector quantization: distortion measures	Board	T1	
29	23	Codebook Design	Board	T1	
30	24	Codebook Types	Board	T1	
31	25	Revision			
32	26	Spectral distortion measures	Board	T1, T2	
33	27	Quantization based on reflection coefficient	Board	T1	
34	28	Quantization based on log area ratio	Board	T1	
35	29	Bit allocation; Line spectral frequency	Board	T1, T2	
36	30	LPC to LSF conversions	Board	T1	
37	31	Quantization based on LSF	Board + PPT	T1	
38	32	Linear Prediction Coding	Board	T1	
39	33	LPC model of speech production	Board	T1, T2	
40	34	Structures of LPC encoders and decoders	Board	T1, T2	
41	35	Voicing detection; Limitations of the LPC model.	Board	T1	
42	36	Revision			
43	37	Code Excited Linear Prediction-	Board	T1	
44	38	CELP speech production model	Board	T1	
45	39	Analysis-by-synthesis	Board	T1	
46	40	Generic CELP encoders and decoders	Board	T1	
47	41	Excitation codebook search – state-save method	Board	T1	
48	42	Zero- input zero- state method; CELP based on adaptive codebook	Board	T1	
49	43	Adaptive Codebook search	Board + PPT	T1	
50	44	Low Delay CELP and algebraic CELP	Board + PPT	T1, T2	
51	45	Speech Coding Standards An overview of ITU-T G.726	Board + PPT	T1, T2	
52	46	G.728 and G.729standards	Board	T1, T2	
53	47	Revision			

Study Material / Books / Web-resources / Online Courses Links etc.

S. No.	Description
1	A.M.Kondoz, "Digital Speech", Second Edition (Wiley Students" Edition), 2004.
2	W.C. Chu, "Speech Coding Algorithms: Foundation and Evolution of Standardized Coders", Wiley Inter science, 2003.