Lecture Plan
B.Tech Electronics and Instrumentation Engineering 8th Semester

Subject Name: Digital Signal Processing

Unit	Topic	Lecture	Reference
Introduction (1 hour)	Introduction of DSP, its advantages over analog signal processing, Application of DSP	**Lecture 1**	1.Digital Signal Processing : Proakis and Manolakis; PHI 2. Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH
UNIT1: DISCRETE-TIME SIGNALS (5 hours)	Signal classifications, frequency and time domain representation of signals, Representation of sequences by Fourier transform	**Lecture 2**	1.Digital Signal Processing : Proakis and Manolakis; PHI 2. Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH
	Properties of Fourier transform with numerical practice	**Lecture 3,4**	Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH
	Discrete time random signals, Energy and power theorems with numerical practice	**Lecture 5,6**	Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH
UNIT2. DISCRETE-TIME SYSTEMS (4 hours)	Classification of systems, Properties of systems	**Lecture 7,8**	Digital Signal Processing : Proakis and Manolakis; PHI
	Time invariant system	**Lecture 9**	Digital Signal Processing : Proakis and Manolakis; PHI
	Finite impulse Response (FIR) system, Infinite impulse response(IIR) system.	**Lecture 10**	1.Digital Signal Processing : Proakis and Manolakis; PHI 2. Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH
UNIT3. SAMPLING OF TIME SIGNALS (4 hours)	Sampling theorem and its Application	**Lecture 10**	Digital Signal Processing : Proakis and Manolakis; PHI
	Frequency domain representation of sampled signal, Reconstruction of band limited signal from its samples	**Lecture 11**	Digital Signal Processing : Proakis and Manolakis; PHI
	Discrete time processing of continuous time signals	**Lecture 12**	Digital Signal Processing : Proakis and Manolakis; PHI
	Changing the sampling rate using discrete time processing.	**Lecture 13**	Digital Signal Processing : Proakis and Manolakis; PHI
UNIT4. Z-TRANSFORM **(7 hours)**	Introduction, Properties of the region of convergence with numerical practice	**Lecture 14,15**	Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH
	Properties of the Z-transform	**Lecture 16,17**	Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH
	Inversion of the Z-	**Lecture18,19**	Digital Signal Processing: Salivahanan,

	transform, Applications of Z-transform.		Vallavaraj and Gnanapriya;TMH
	Numerical practice and queries	**Lecture 20**	**TEXT BOOKS :** 1. Digital Signal Processing : Proakis and Manolakis; PHI 2. Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH **REFERENCE BOOKS:** 1. Digital Signal Processing: Alon V. Oppenhelm;PHI 2. Digital Signal processing(II-Edition): Mitra, TMH Previous year question papers of competitive and university exams
UNIT5. BASICS OF DIGITAL FILTERS **(9 hours)**	Fundamentals of digital filtering, various types of digital filters	**Lecture 21**	1. Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH 2. Digital Signal Processing: Alon V. Oppenhelm;PHI
	Design techniques of digital filters : window technique for FIR	**Lecture 22**	1. Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH 2. Digital Signal Processing: Alon V. Oppenhelm;PHI
	Bi-linear transformation and backward difference methods for IIR filter design	**Lecture 23,24**	1. Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH 2. Digital Signal Processing: Alon V. Oppenhelm;PHI
	analysis of finite word length effects in DSP	**Lecture25**	Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH
	FIR &IIR Filter structure-direct1,direct2,cascadeand parallel, Application of DSP.	**Lecture26,27**	Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH
	Numerical practice and queries	**Lecture 28,29**	**TEXT BOOKS :** 1. Digital Signal Processing : Proakis and Manolakis; PHI 2. Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH **REFERENCE BOOKS:** 1. Digital Signal Processing: Alon V. Oppenhelm;PHI 2. Digital Signal processing(II-Edition): Mitra, TMH Previous year question papers of competitive and university exams
UNIT6. MULTIRATE DIGITAL SIGNAL PROCESSING (8 hours)	Introduction to multirate digital signal processing	**Lecture 30**	Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH
	Sampling rate conversion	**Lecture 31**	1.Digital Signal Processing : Proakis and Manolakis; PHI 2. Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH
	Filter structures	**Lecture 32,33**	Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH

	Multistage decimator and interpolators	**Lecture 34**	Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH
	Digital filter banks	**Lecture 35**	Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH
	Numerical practice	**Lecture 36,37**	**TEXT BOOKS :** 1. Digital Signal Processing : Proakis and Manolakis; PHI 2. Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH **REFERENCE BOOKS:** 1. Digital Signal Processing: Alon V. Oppenhelm;PHI 2. Digital Signal processing(II-Edition): Mitra, TMH Previous year question papers of competitive and university exams
	Queries, revision, quiz and class test of full syllabus	**Lecture 38,39**	
	Discussion of the solution of class tests	**Lecture 40**	