

## Lesson Plan

Name of the Faculty: Er. Gagandeep Singh (Theory)

Discipline: Electrical Engineering

Semester: 6<sup>th</sup>

Subject: Digital Signal Processing (EEN- 312N)

Lesson plan: 15 Weeks ( From January, 2018 to April, 2018)

Lecture per Week (in Hours): Lectures-03

Week	Lecture Day	Theory
		Topic
1 <sup>st</sup>	1	<b>Unit-1</b> Basic elements of DSP, Advantages and disadvantage and Application of Digital signal processing
	2	Z-Transform (ZT) & ROC, Properties of ZT
	3	Inverse ZT, Function representation
2 <sup>nd</sup>	4	One-sided ZT, System function of LTI systems
	5	<b>Assignment 1 “Solution of difference equations”</b>
	6	Analysis of LTI system in Z- domain (Transient Response)
3 <sup>rd</sup>	7	Analysis of LTI system in Z- domain (Steady-state Response & Total response)
	8	Causality and stability, Pole- Zero Cancellations
	9	<b>Test of Unit-1</b>
4 <sup>th</sup>	10	<b>Unit-2</b> Introduction to DFT
	11	Direct Computation of DFT
	12	Properties of DFT
5 <sup>th</sup>	13	<b>Assignment 2 “Circular Convolution”</b>
	14	Introduction to FFT
	15	FFT algorithms (decimation in time)
6 <sup>th</sup>	16	FFT algorithms (decimation in frequency)
	17	Application of FFT to Linear Filtering
	18	Goertzel Algorithm
7 <sup>th</sup>	19	<b>Assignment 3 “Chirp-Z Transform”</b>
	20	<b>Test of Unit-2</b>
	21	<b>Unit-3</b> Introduction to FIR & IIR Systems, Direct form-I & II structure of FIR systems
8 <sup>th</sup>	22	Linear phase, Cascade form of FIR Systems
	23	Frequency Sampling structures of FIR Systems
	24	Direct form-I & II structure of IIR systems
9 <sup>th</sup>	25	Cascade, Parallel & transposed structure of IIR systems
	26	<b>Assignment 4 “Symmetric and anti-symmetric FIR filters”</b>
	27	Design of FIR filters using Windows techniques
10 <sup>th</sup>	28	Design of FIR filters using Windows techniques (Continued)

	29	Frequency Sampling Method of FIR design
	30	Impulse Invariance transformation
11th	31	Bilinear transformation
	32	Butterworth IIR filters design
	33	Chebyshev IIR filters design
12th	34	Frequency transformation in Digital Domain
	35	<b>Assignment 5 “Matched Z-Transformation”</b>
	36	<b>Test of Unit-3</b>
13th	37	<b>Unit-4</b> Lattice Structures of IIR systems
	38	Ladder and Lattice-Ladder Structures of IIR systems
	39	Lattice-Ladder Structures (Continued)
14th	40	Shur- Cohn Stability test
	41	<b>Assignment 6 “Jury Test”</b>
	42	Shur-Cohn-Fuzzivera stability test
15th	43	Discrete Hilbert Transform
	44	<b>Test of Unit-4</b>
	45	<b>Test of all Units</b>

## Lesson Plan

Name of the Faculty: Er. Gagandeep Singh (Practical)

Discipline: Electrical Engineering

Semester: 6<sup>th</sup>

Subject: Digital Signal Processing (EEN- 314N)

Lesson plan: 15 Weeks ( From January, 2018 to April, 2018)

Lecture per Week (in Hours): Lectures-03

Week	Lecture Day	Practical
		Topic
1 <sup>st</sup>	1	Introduction to MATLAB software and its basic & subject oriented commands.
2 <sup>nd</sup>	2	Write a program in MATLAB to study the basic operation on the discrete time signals.
3 <sup>rd</sup>	3	Write a MATLAB program to perform discrete linear convolution for a given two sequences.
4 <sup>th</sup>	4	Write a MATLAB program to perform discrete circular convolution for a given two sequences.
5 <sup>th</sup>	5	<b>VIVA 1</b>
6 <sup>th</sup>	6	Write a MATLAB program to perform the DFT for a given sequence.
7 <sup>th</sup>	7	Write a MATLAB program to compute DFT & IDFT for a given sequence using FFT algorithm.
8 <sup>th</sup>	8	Write a MATLAB program to perform sampling rate conversion for any given arbitrary sequence by interpolation, decimation.
9 <sup>th</sup>	9	Write a MATLAB program to perform sampling rate conversion for any given arbitrary sequence by upsampling, downsampling and resampling.
10 <sup>th</sup>	10	<b>VIVA 1</b>
11 <sup>th</sup>	11	Write a MATLAB program to find the time domain response (Impulse response and phase response) for a given FIR and IIR systems.
12 <sup>th</sup>	12	Write a MATLAB program to design low pass filter using window method for the given specification.
13 <sup>th</sup>	13	Write a MATLAB program to design a low pass filter using window method for the given specification.
14 <sup>th</sup>	14	Write a MATLAB program to design Butterworth and Chebyshev low pass filter using bilinear transformation and Impulse Invariant Transformation
15 <sup>th</sup>	15	<b>VIVA 1</b>