SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Department of Electrical and Electronics Engineering	LP: EE18505 Rev. No: 00 Date: 22.06.2020
B.E B.Tech/M.E M.Tech : B.E - EEE Regulation : 2018 PG Specialisation : NA Sub. Code / Sub. Name : EE18505/ DIGITAL SIGNAL PROCESSING Unit : I	

Unit I Syllabus: INTRODUCTION Classification of Systems, Classification of Signals, Mathematical representation of signals, Analog to Digital conversion Techniques – Sampling, Nyquist rate, Aliasing effect - Quantization techniques, Truncation and Rounding, Quantization error – Coding.

Objective: To classify the signals and systems and learn about the mathematical representation, Analog to Digital conversion techniques.

Session No *	Topics to be covered	Ref	Teaching Aids
1.	Classification of Systems	1,2	PPT, Video
2.	Classification of Systems	1,2	PPT, Video
3.	Classification of Signals	1,2	PPT, Video
4.	Classification of Systems	1,2	PPT, Video
5.	Mathematical representation of signals	1,2	PPT, Video
6.	Analog to Digital conversion Techniques	1,2	PPT, Video
7.	Sampling, Nyquist rate, Aliasing effect	1,2	PPT, Video
8.	Quantization techniques, Truncation and Rounding	1,2	PPT, Video
9.	Quantization error – Coding	1,2	PPT, Video

Content beyond syllabus covered (if any):

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* Session duration: 50 minutes

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Sub. Code / Sub. Name: EE18505/ DIGITAL SIGNAL PROCESSING

Unit : II

Unit II Syllabus: DISCRETE TIME SYSTEMS- Linear Convolution, Circular Convolution, Correlation – Z-transform and properties, Inverse Z-transform; Difference equation – Solution by Z-transform, Application to discrete time systems -Frequency response - Stability analysis.

Objective: To understand the representation of discrete time systems and apply z-transform techniques to evaluate the frequency response and stability analysis.

Session No *	Topics to be covered	Ref	Teaching Aids
10.	Linear Convolution, Correlation	1,2	PPT, Video
11.	Circular Convolution	1,2	PPT, Video
12.	Z-transform and properties	1,2	PPT, Video
13.	Problems -Z-transform	1,2	PPT, Video
14.	Inverse Z-transform	1,2	PPT, Video
15.	Problems - Inverse Z-transform	1,2	PPT, Video
16.	Difference equation – Solution by Z-transform	1,2	PPT, Video
17.	Application to discrete time systems -Frequency response - Stability analysis.	1,2	PPT, Video
18.	Problems- Application to discrete time systems -Frequency response - Stability analysis	1,2	PPT, Video

Content beyond syllabus covered (if any):

* Session duration: 50 mins

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Sub. Code / Sub. Name: EE18505 DIGITAL SIGNAL PROCESSING

Unit III

Unit III Syllabus: DISCRETE FOURIER TRANSFORM & COMPUTATION: Discrete Fourier Transform and properties. Magnitude and Phase representation – Fast Fourier Transform. Computation of DFT and IDFT using radix-2 FFT algorithms– DIT & DIF Butterfly structure.

Objective: To study various transformation techniques and their computation.

Session No *	Topics to be covered	Ref	Teaching Aids
19.	Discrete Fourier Transform and properties	1,2	PPT, Video
20.	DFT - Magnitude and Phase representation	1,2	PPT, Video
21.	Problems - DFT	1,2	PPT, Video
22.	Problems - DFT	1,2	PPT, Video
23.	Fast Fourier Transform , Computation of DFT and IDFT using radix-2 FFT algorithms	1,2	PPT, Video
24.	DIT Algorithm	1,2	PPT, Video
25.	DIT Algorithm	1,2	PPT, Video
26.	DIF Algorithm	1,2	PPT, Video
27.	DIF Algorithm	1,2	PPT, Video

Content beyond syllabus covered (if any):

* Session duration: 50 mins

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Sub. Code / Sub. Name: EE18505 DIGITAL SIGNAL PROCESSING

Unit : IV

Unit IV Syllabus: DESIGN OF DIGITAL FILTERS: FIR & IIR filter realization - Cascade & Parallel forms. FIR design: Windowing Techniques – Need and Choice of windows – Linear Phase characteristics – IIR filter design – Butterworth and Chebyshev approximations, Digital design using Impulse Invariant and Bilinear transformation– Warping, pre-warping.

Objective: To study about the structural realization of FIR, IIR Digital filters and their design.

Session No *	Topics to be covered	Ref	Teaching Aids
28.	FIR & IIR filter realization- Direct form I & II	1,2	PPT, Video
29.	FIR & IIR filter realization - Cascade & Parallel forms	1,2	PPT, Video
30.	FIR design- Windowing Techniques	1,2	PPT, Video
31.	Problems on FIR design using Windowing Techniques	1,2	PPT, Video
32.	Problems on FIR design using Windowing Techniques, Linear Phase characteristics	1,2	PPT, Video
33.	IIR filter design- Butterworth approximations- Bilinear transformation transformation	1,2	PPT, Video
34.	IIR filter design- Butterworth approximations- Impulse Invariant transformation	1,2	PPT, Video
35.	IIR filter design Chebyshev approximations- Bilinear transformation transformation	1,2	PPT, Video
36.	IIR filter design Chebyshev approximations- Impulse Invarian transformation	1,2	PPT, Video

Content beyond syllabus covered (if any):

* Session duration: 50 mins

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Sub. Code / Sub. Name: EE18505 DIGITAL SIGNAL PROCESSING

Unit : V

Unit V Syllabus: DIGITAL SIGNAL PROCESSORS: Introduction to DS processors – Architecture – Features - Addressing Formats – Functional modes – Motor control application using DS Processor

Objective: To impart knowledge about the programmable digital signal processors and applications.

Session No *	Topics to be covered	Ref	Teaching Aids
37.	Introduction to DS processors	1.2	PPT, Video
38.	DS processors- Architecture, Features	1.2	PPT, Video
39.	DS processors- Architecture, Features	1.2	PPT, Video
40.	Addressing Formats	1.2	PPT, Video
41.	Functional modes	1.2	PPT, Video
42.	Functional modes	1.2	PPT, Video
43.	Motor control application using DS Processor	1.2	PPT, Video
44.	Motor control application using DS Processor	1.2	PPT, Video
45.	Motor control application using DS Processor	1.2	PPT, Video

Content beyond syllabus covered (if any):

* Session duration: 50 mins

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Sub Code / Sub Name: **EE18505/ DIGITAL SIGNAL PROCESSING**

TEXT BOOKS :

1. J.G. Proakis and D.G. Manolakis, 'Digital Signal Processing Principles, Algorithms and applications', Pearson Education, New Delhi, PHI, 2003.
2. S.K. Mitra, 'Digital Signal Processing–A Computer Based Approach', McGraw Hill Edu, 2013.
3. Robert Schilling & Sandra L. Harris, Introduction to Digital Signal Processing using Matlab", Cengage Learning, 2014.
4. Sen. M. Kuo, Woon-Seng S Gan, "Digital Signal Processors, Architecture, Implementations & Applications, Pearson, 2013.

REFERENCES:

1. Poorna Chandra. S, Sasikala.B, Digital Signal Processing, Vijay Nicole, Tata McGraw Hill, 2013.
2. B.P. Lathi, 'Principles of Signal Processing and Linear Systems', Oxford University Press, 2010.
3. Taan S. ElAli, 'Discrete Systems and Digital Signal Processing with Matlab', CRC Press, 2009.
4. Dimitris G.Manolakis, Vinay K.Ingle, Applied Digital Signal Processing, Cambridge, 2012.
5. P. Ramesh Babu, Digital Signal Processing, Scitech Publications (India) Pvt. Ltd.
6. S. Salivahanan, A. Vallavaraj and C. Gnanapriya, Digital Signal Processing, Tata McGraw Hill.

	Prepared by	Approved by
Signature		
Name	S.SETHURAMAN K. S. PAVITHRA	Dr. K.R SUDHAKAR Dr. KR. SANTHA
Designation	Assistant Professor	Professor and Head of the Department
Date	15.9.2020	16.9.2020
Remarks *:	Same lesson plan is followed for the academic year 2021-22, ODD semester.	27/7/2021 KR. Sant 27.7.21
Remarks *:	Same lesson plan is followed for the AY-2022-23-ODD sem	29/06/22 KR. Sant 27.6.22 (HOD, EEE)

* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD

Same Lesson plan is followed for the academic year of 2023-2024, ODD semester.

08/08/2023 8/8/23 KR. Sant 8.8.23 (HOD, EEE)