

BHUBANANANDA ORISSA SCHOOL OF ENGINEERING, CUTTACK

Lesson Plan of Digital Signal Processing

by

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Summer-2022

VISION & MISSION OF APPLIED ELECTRONICS & INSTRUMENTATION ENGINEERING DEPARTMENT

VISION OF THE DEPARTMENT:-

To produce efficient professional in applied electronics & instrumentation engineering and other allied areas with update technical knowledge to meet the challenges of society in relevant sector.

MISSION OF THE DEPARTMENT:-

- To provide the student competent in applied electronics and instrumentation engineering with societal, environmental and human values through quality education, training.
- Provide knowledge of basic science, applied mathematics, instrumentation technology and communicative skills to identify and solve problems related to Applied Electronics and Instrumentation engineering.
- To enable the students to acquire various parameter measurement and automatic control technology used for industrial automation and inculcate quality of leadership, mentorship & teamwork in collaboration with parents, alumni & industry.

PROGRAMME EDUCATIONAL OBJECTIVES:

- To provide students with a solid foundation in basic science, electrical, electronics, instrumentation and interdisciplinary subjects that is necessary to excel in professional career, entrepreneur in future and/or higher education.
- To prepare students to meet the needs and face the challenges of real life as well as industry automation and digitalization in terms of technical, economic and social feasibility.
- To inculcate professionalism, communication skills, attitudes, team work and to adapt to the current trends by engaging in lifelong learning.
- To utilize the technology in domestic, medical, industry and community for proper utilization of instrument for measurement & control.

Discipline: Applied Electronics & Instrumentation Engineering.		Semester : 6 th	Name of the teaching faculty: Sidharth Sekhar Mallick
Subject: Digital Signal Processing		No. of Days/per week class allotted: 04 periods/ per week (MON ,MED , THU & SAT :- 1 Period each)	Semester From Date:- 10-03-2022 To Date:- 10-06-2022 No. of weeks: 14 weeks
Week	Class Day	Theory Topics	
1 st	10/03/2022 11/03/2022	Introduction, syllabus discussion Ch:-1.Introduction of Signals, Systems &Signal processing 1.1 Basics of Signals. Systems &Signal processing-basic elements of a digital signal processing system-Compare the advantages of digital signal processing over analog signal processing.	
2 nd	14/03/2022 16/03/2022	1.2 Classify Signals-Multi Channels &Multi-dimensional signal, continuous time verses Discrete-valued signals. 1.3 Concepts of Frequency in continuous time &discrete time's signals, continuous-time Sinusoidal signal-Harmonically related complex exponential.	
	17/03/2022	1.4 Analog to Digital & Digital to Analog Conversion & explain the following. a. Sampling of Analog Signal. b. The sampling theorem. Continuing...	
3 rd	21/03/2022 23/03/2022	c. Quantization of continuous amplitude Signals. d. Coding of quantized sample. e. Digital to Analog Conversion. f. Analysis of digital system Signals vs. discrete time signals systems.	
	24/03/2022	Ch:-2. DISCRETE TIME SIGNALS & SYSTEMS. 2.1 Concept of Discrete time signals.	
	26/03/2022	2.1.1 Elementary Discrete time signals.	
4 th	28/03/2022	2.1.2 Classification Discrete time signals.	
	30/03/2022	2.1.3 Simple manipulation of discrete time signals	
	31/03/2022	2.2 Discrete time system. 2.2.1 Input-output of system.	
	02/04/2022	2.2.2Block diagram of discrete-time systems 2.2.3Classify discrete time system.	

5 th	04/04/2022	2.2.3 Classify discrete time system. 2.2.4 Inter connection of discrete-time systems. 2.3 Discrete time-invariant system. 2.3.1 Different techniques for the Analysis of linear systems. 2.3.2 Resolution of a Discrete time signal in to impulse. 2.3.3 Response of LTI system to arbitrary inputs using convolution sum. 2.3.4 Convolution & interconnection of LTI system - properties. 2.3.5 Study Systems with finite duration and infinite duration impulse response.
	06/04/2022	
	07/04/2022	
	09/04/2022	Revision on Chapter 1 & 2
6 th	11/04/2022	Class Test-1
	13/04/2022	2.4 Discrete time system described by difference equation. 2.4.1 Recursive & non-recursive discrete time system. 2.4.2 Determine the impulse response of linear time invariant recursive system. 2.4.3 correlation of Discrete time signals
	16/04/2022	Ch:::3. THE Z-TRANSFORM & ITS APPLICATIONS TO THE ANALYSIS OF LTI SYSTEM.
		3.1 Z-transform & it's applications to LTI system. 3.1.1 Direct Z-transform.
7 th	18/04/2022	3.1.2 Inverse Z-transform.
	20/04/2022	3.2 Various properties of Z-transform. 3.3 Rational Z-transform.
		3.3.1 Poles & zero. 3.3.2 Pole location time domain behavior for casual signal. 3.3.3 System functions of a linear time invariant system. 3.4 Discuss inverse Z-transform.
	21/04/2022	
	23/04/2022	3.4.1 Inverse Z-transform by partial fraction expansion. 3.4.2 Inverse Z-transform by counter integration
8 th	25/04/2022	Ch:::4 DISCUSS FOURIER TRANSFORM: ITS APPLICATIONS PROPERTIES.
	27/04/2022	4.1 Concept of discrete Fourier transforms. 4.2 Frequency domain sampling and reconstruction of discrete time signals.
	28/04/2022	4.3 Discrete Time Fourier transformation (DTFT)
	30/04/2022	4.4 Discrete Fourier transformation (DFT).

9 th	04/05/2022	Revision on Chapter 3 & 4
	05/05/2022	Class Test-2
	07/05/2022	4.5 Compute DFT as a linear transformation.
10 th	09/05/2022	Internal assessment
	11/05/2022	4.6 Relate DFT to other transforms.
	12/05/2022	4.7 Property of the DFT
	14/05/2022	4.8 Multiplication of two DFT & circular convolution
11 th	18/05/2022	5. FAST FOURIER TRANSFORM ALGORITHM & DIGITAL FILTERS.
		5.1 Compute DFT & FFT algorithm.
		5.2 Direct computation of DFT.
	19/05/2022	5.3 Divide and conquer Approach to computation of DFT.
	21/05/2022	5.4 Radix-2 algorithm (Small problems)
12 th	23/05/2022	Revision on Chapter 1,2,3 & 4
	25/05/2022	Important previous year question discussion
	26/05/2022	5.5 Applications of FFT algorithms.
	28/05/2022	5.6 Introduction to digital Filters (FIR Filters) & general considerations.
13 th	01/06/2022	5.7 Introduction to DSP architecture, familiarization of different types of processor
	02/06/2022	Revision on Chapter 4 & 5
	04/06/2022	Class Test-3
14 th	06/06/2022	Revision on Chapter 1 & 2
	08/06/2022	Revision on Chapter 3 & 4
	09/06/2022	Revision on Chapter 1,2,3,4 & 5