

BHUBANANANDA ORISSA SCHOOL OF ENGINEERING, CUTTACK

Lesson Plan of Digital Signal Processing

by

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Academic Year -2022-23(summer)

VISION & MISSION OF APPLIED ELECTRONICS & INSTRUMENTATION ENGINEERING DEPARTMENT

VISION OF THE DEPARTMENT:-

To produce efficient professional in applied electronics & instrumentation engineering and other allied area's 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 ,WED , THU & SAT :- 1 Period each)	Semester From Date:- 14-02-2023 To Date:- 23-05-2023 No. of weeks: 15 weeks
Week	Class Day	Theory Topics
1 st	15/02/2023	Introduction, syllabus discussion and previous year question discussion
	16/02/2023	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	20/02/2023	1.2 Classify Signals-Multi Channels &Multi-dimensional signal, continuous time verses Discrete-valued signals.
	22/02/2023	1.3 Concepts of Frequency in continuous time &discrete time's signals, continuous-time Sinusoidal signal-Harmonically related complex exponential.
	23/02/2023	1.4 Analog to Digital & Digital to Analog Conversion & explain the following. a. Sampling of Analog Signal. b. The sampling theorem. Continuing...
	25/02/2023	c. Quantization of continuous amplitude Signals. d. Coding of quantized sample.
3 rd	27/02/2023	e. Digital to Analog Conversion. f. Analysis of digital system Signals vs. discrete time signals systems.
	01/03/2023	Ch.:-2. DISCRETE TIMES SIGNALS & SYSTEMS. 2.1 Concept of Discrete time signals.
	02/03/2023	2.1.1 Elementary Discrete time signals.
	04/03/2023	2.1.2 Classification Discrete time signals.
4 th	06/03/2023	2.1.3 Simple manipulation of discrete time signals
	09/03/2023	2.2 Discrete time system.

		2.2.1 Input-output of system.
	11/03/2023	2.2.2 Block diagram of discrete-time systems
5 th	13/03/2023	2.2.3 Classify discrete time system
	15/03/2023	2.2.4 Inter connection of discrete-time systems.
	16/03/2023	2.3 Discrete time-invariant system. 2.3.1 Different techniques for the Analysis of linear systems
	18/03/2023	2.3.2 Resolution of a Discrete time signal in to impulse.
6 th	20/03/2023	2.3.3 Response of LTI system to arbitrary inputs using convolution sum.
	22/03/2023	2.3.4 Convolution & interconnection of LTI system - properties.
	23/03/2023	2.3.5 Study Systems with finite duration and infinite duration impulse response.
	25/03/2023	2.4 Discrete time system described by difference equation. 2.4.1 Recursive & non-recursive discrete time system.
7 th	27/03/2023	2.4.2 Determine the impulse response of linear time invariant recursive system.
	29/03/2023	2.4.3 correlation of Discrete time signals
8 th	03/04/2023	Revision on Chapter 1 & 2
	05/04/2023	Class Test-1
	06/04/2023	Ch.-3. THE Z-TRANSFORM & ITS APPLICATIONS TO THE ANALYSIS OF LTI SYSTEM. 3.1 Z-transform & its applications to LTI system.
	08/04/2023	3.1.1 Direct Z-transform.
9 th	10/04/2023	3.1.2 Inverse Z-transform.
	12/04/2023	3.2 Various properties of Z-transform.
	13/04/2023	3.3 Rational Z-transform. 3.3.1 Poles & zero. 3.3.2 Pole location time domain behavior for casual signal.
	15/04/2023	3.3.3 System functions of a linear time invariant system.
10 th	17/04/2023	3.4 Discuss inverse Z-transform. 3.4.1 Inverse Z-transform by partial fraction expansion.
	19/04/2023	3.4.2 Inverse Z-transform by counter integration
	20/04/2023	Ch.-4 DISCUSS FOURIER TRANSFORM: ITS APPLICATIONS PROPERTIES. 4.1 Concept of discrete Fourier transforms.
	22/04/2023	4.2 Frequency domain sampling and reconstruction of discrete

		time signals.
11 th	24/04/2023	Internal assessment
	26/04/2023	Internal assessment
	27/04/2023	4.3 Discrete Time Fourier transformation (DTFT) 4.4 Discrete Fourier transformation (DFT).
	29/04/2023	4.5 Compute DFT as a linear transformation.
12 th	01/05/2023	4.6 Relate DFT to other transforms. 4.7 Property of the DFT
	03/05/2023	4.8 Multiplication of two DFT & circular convolution
	04/05/2023	Revision on Chapter 3&4
	06/05/2023	5. FAST FOURIER TRANSFORM ALGORITHM & DIGITAL FILTERS. 5.1 Compute DFT & FFT algorithm. 5.2 Direct computation of DFT.
13 th	08/05/2023	5.3 Divide and conquer Approach to computation of DFT.
	10/05/2023	2nd Internal assessment
	11/05/2023	5.4 Radix-2 algorithm.(Small problems)
	13/05/2023	5.5 Applications of FFT algorithms. 5.6 introduction to digital Filters.(FIR Filters)& general considerations
14 th	15/05/2023	5.7 Introduction to DSP architecture, familiarization of different types of processor
	17/05/2023	Revision on Chapter 1,2,3 4&5
	18/05/2023	Revision on Chapter 1,2,3 4&5
	20/05/2023	Class Test-2
15 th	22/05/2023	Important previous year question discussion