



GOVERNMENT POLYTECHNIC, BALASORE

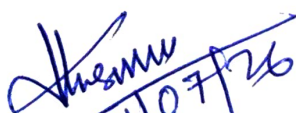
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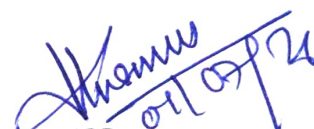
ବରକାରୀ ବହୁବୃତ୍ତି ଅନୁଷ୍ଠାନ, ବାଲେଶ୍ଵର

LESSON PLAN (SUMMER-2026)

Discipline: ELECTRONICS & TELECOMMUNICATION ENGINEERING	Semester: 3 RD	Name of the Teaching Faculty: Jadunath Murmu (Sr. Lect. E&TC)
Subject: Signal & Systems	No of Days / Per week class allotted: 3	Semester From date: 1 ST July, 2026 No of Weeks: 15
Week	Class Day	Theory / Practical Topics
1st	1st	Introduction to Signals and Systems (5) 1.1 Signals and systems as seen in everyday life
	2nd	1.2 Signals and systems in various branches of engineering
	3rd	1.3 Electrical, mechanical, hydraulic, thermal, biomedical signals and systems as examples
2nd	1st	1.4 Extracting the common essence and requirements of signal and system
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	3rd	Formalizing signals (7) 2.1 Energy and power signals
3rd	1st	2.2 Signal properties 2.2.1 Periodicity
	2nd	2.2.2 Absolute integrability 2.2.3 Determinism and stochastic character
	3rd	2.3 Some special signals of importance 2.3.1 The unit step 2.3.2 The unit impulse 2.3.3 The sinusoid
4th	1st	2.3.4 The complex exponential 2.4 some special time-limited signals 2.4.1 Continuous and discrete time signals
	2nd	2.4.2 Continuous and discrete amplitude signals. 2.5 Formalizing systems-system properties 2.5.1 Linearity
	3rd	2.5.2 Additivity and homogeneity 2.5.3 Shift-invariance 2.5.4 Causality 2.5.5 Stability 2.5.6 Reliability
5th	1st	Continuous time and discrete time Systems (7) 3.1 Linear shift-invariant (LSI) systems in detail 3.2 The impulse response and step response
	2nd	3.3 Convolution
	3rd	3.4 Input-output behavior with aperiodic convergent inputs
6th	1st	3.5 Cascade interconnections
	2nd	3.6 Characterization of causality and stability of linear shift-invariant systems
	3rd	3.7 System representation through differential equations and difference equations
7th	1st	3.7 System representation through differential equations and difference equations
	2nd	Periodic and semi-periodic inputs to an LSI system(7) 4.1 The notion of a frequency response and its relation to the impulse response
	3rd	4.2 Fourier series representation 4.3 The Fourier Transform

8th	1st	4.4 Convolution/multiplication and their effect in the frequency domain, magnitude and phase response, Fourier domain duality.
	2nd	4.5 The Discrete-Time Fourier Transform (DTFT)
	3rd	4.6 The Discrete Fourier Transform (DFT)
9th	1st	4.7 Parseval's Theorem
	2nd	4.8 The idea of signal space and Orthogonal bases of signals.
	3rd	Laplace Transform for continuous time signals and systems(7) 5.1 The notion of Eigen functions of LSI systems
10th	1st	5.2 A basis of Eigen functions 5.3 Region of convergence
	2nd	5.4 System functions
	3rd	5.5 Poles and zeros of system functions and signals
11th	1st	5.6 Laplace domain analysis
	2nd	5.7 Solution to differential equations and system behavior
	3rd	5.8 Generalization of Parseval's Theorem
12th	1st	System realization (7) 6.1 System realization through block-diagram representation and system interconnection
	2nd	6.2 State-space analysis and multi-input, multi-output representation.
	3rd	6.3 The state-transition matrix and its role. 6.4 The Sampling Theorem and its implications
13th	1st	6.4.1 Spectra of sampled signals.
	2nd	6.5 Reconstruction: 6.5.1 Ideal interpolator
	3rd	6.5.2 Zero-order hold 6.5.3 First-order hold
14th	1st	6.6 Aliasing and its effects. 6.7 Relation between continuous and discrete time systems.
	2nd	Applications of signal and system theory (5) 7.1 Modulation for communication and filtering
	3rd	7.2 Time-frequency representation and the uncertainty principle
15th	1st	7.2 Time-frequency representation and the uncertainty principle
	2nd	7.3 Short-time Fourier Transforms and wavelet transforms
	3rd	7.3 Short-time Fourier Transforms and wavelet transforms


 Faculty 01/07/26


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