BVM ENGINEERING COLLEGE [AN AUTONOMOUS INSTITUTION]

2EC09: SIGNALS AND SYSTEMS
CREDITS - 3 (LTP:3,0,0)

Course Objective:
Students of EC Engineering need to possess good understanding of concepts and principles of Signals & Systems by applying theorems and Transformation.

Teaching and Assessment Scheme:

Teaching Scheme (Hours per week)			Credits	Assessment Scheme				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE	CE	ESE	CE	
3	0	0	3	60	40	00	00	100

Course Contents:

Unit No.	Topics	Teaching Hours
1.	**Introduction to Signals and Systems :** Introduction ,Signals and Classification of Signals, Basic Continuous-Time Signals ,Basic Discrete-Time Signals, Systems and Classification of Systems	07
2.	**Linear Time-Invariant Systems** : Introduction, Response of a Continuous-Time LTI System and the Convolution Integral, Properties of Continuous-Time LTI Systems, Eigen functions of Continuous-Time LTI Systems, Systems Described by Differential, Response of a Discrete-Time LTI System and Convolution Sum, Properties of Discrete-Time LTI Systems, Eigen functions of Discrete-Time LTI Systems, Systems Described by Difference Equations	08
3.	**Laplace Transform and Continuous-Time LTI Systems** : Introduction, The Laplace Transform, Laplace Transforms of Some Common Signals, Properties of the Laplace Transform, The Inverse Laplace Transform, The System Function, The Unilateral Laplace Transform.	07
4.	**Fourier Analysis of Continuous-Time Signals and Systems:** Introduction, Fourier Series Representation of Periodic Signals, The Fourier Transform, Properties of the Continuous-Time Fourier Transform, The Frequency Response of Continuous-Time LTI Systems ,Filtering, Bandwidth	08
5.	**Fourier Analysis of Discrete-Time Signals and Systems :** Introduction, Discrete Fourier Series, The Fourier Transform, Properties of the Fourier Transform, The Frequency Response of Discrete-Time LTI Systems, System Response to Sampled Continuous-Time Sinusoids, The Discrete Fourier Transform	08
6.	**State Space Analysis :** Introduction, the Concept of State, State Space Representation of Discrete-Time LTI Systems, State Space Representation of Continuous-Time LTI	07

Unit No.	Topics	Teaching Hours
	Systems, Solutions of State Equations for Discrete-Time LTI Systems, Solutions of State Equations for Continuous-Time LTI Systems	
	Total	45

List of References:

1. Alan V. Oppenheim, Alan S.Wilsky, with S.Hamid Nawab, *"Signals and Systems"*, Prentice-Hall of India.2nd Edition, 2010.
2. H P HSU, *"Signals and systems",* Schaums outlines series 2006, TATA McGraw hill.
3. M.J.Roberts, *"Signals and Systems"*, Tata McGraw-Hill,2006
4. Kumar, A. A. *"Signals and Systems"*, PHI Learning Pvt. Ltd.
5. Simon Haykin, *"Signals and Systems ",* Wiley Eastern Ltd., New Delhi.

Course Outcomes:

1. Understand the analytical frame work, mathematical description and representation of Signals and systems.
2. Derive and examine a fundamental representation of LTI systems.
3. Understand the concept of concept of continuous time LTI and the use of Laplace transform.
4. Understand the application of Fourier analysis for continuous time signals and systems.
5. Understand the application of Fourier analysis for discrete time signals and systems.
6. Understand and analyze State Space Representation of continuous and discrete time LTI system.