MERI College of Engineering & Technology
(MERI-CET)

Session: 2020-2021 **Course: EEE**

LESSON PLAN

Name of the faculty : Er. Gaurav Kumar

Discipline : Electrical & Electronics

Semester : 4th

Subject : Signal and System/ PCC-EE-214G

Lesson Plan Duration : 17 weeks (From May, 2021 to Oct, 2021)

Work Load (Lecture/ Practical) per week (in hours): Lecture-02

Week	Theory	
	Lecture Day	**Topic(Including assignment/test)**
1st	1st	Introduction To Signal and System
	2nd	Signal Definition, Classification with examples
2nd	1st	Continuous –Time & Discrete –Time, Continuous –valued & Discrete –valued, Analog & Digital, Deterministic & Random Signal
	2nd	One Dimensional & Multi-Dimensional, Even/Symmetric & Odd/Anti symmetric signals, Causal, Non causal & Anti causa
3rd	1st	Real & Complex, Periodic & Aperiodic, Energy & Power signals
	2nd	Representation of Discrete –Time signals, Elementary Discrete Time Signals
4th	1st	Representation of Discrete –Time signals, Elementary Discrete Time Signals
	2nd	Introduction To Discrete-Time Systems And Their Properties
5th	1st	Systems & Their Representation, Independent variable transformations
	2nd	Time Shifting, Time Reversal, Time Scaling Properties.

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6th	1st	Time shifting and reversal
	2nd	Classification of Systems: Hardware, Software & Mixed Systems; Linear & Nonlinear Systems
7th	1st	Static/without memory & Dynamic/ with memory Systems, Causal & Non causal System
	2nd	Invertible & Noninvertible System.
8th	1st	Stable & Unstable System, Time variant & Time Invariant Systems.
	2nd	Linear-Time Invariant (Lti) Systems And Their Advantages
9th	1st	LTI Systems, Discrete –time Signal representation in terms of impulses,
	2nd	Impulse Response of Discrete Time LTI Systems
10th	1st	Finite Impulse Response System, Infinite Impulse Response System
	2nd	LTI Systems Properties
11th	1st	LTI systems representation by Constant –Coefficient Difference Equation
	2nd	LTI System Characterization, Cascade & Parallel Connection of LTI Systems
12th	1st	Introduction To Frequency Domain Representation, Concept of frequency for analog signals and discrete –time signals
	2nd	Fourier Series Representation of Periodic Signals, I/P O/P Relationship for LTI Systems using Fourier Series
13th	1st	Filtering Concept. Fourier Transform representation for Discrete –Time Signals, Properties of Discrete –Time Fourier Transform
	2nd	Systems Characterized by Linear Constant Coefficient Difference Equations.
14th	1st	Laplace Transform
	2nd	Z-Transform And Its Inverse, Introduction to Z-Transform, Region of Convergence (ROC) for Z-Transform, ROC for: Finite & Infinite Duration
15th	1st	Causal, Anti causal & Non causal signals; Z-Transform Properties, Relationship with Fourier Transform, Inverse Z-Transform, Rational Z –Transforms, Poles & Zeros of Signals & Systems

	2nd	Pole Location and Time Domain behaviour for Causal Signals; Applications of Z-Transform: System Function of an LTI System, Causality & Stability of LTI Systems, Pole Zero Cancellation.
16th	1st	State Variable Technique: State Space Representation of Continuous –Time LTI Systems
	2nd	State Space Representation of Discrete –Time LTI System
17th	1st	Solution of State Equation for Discrete-time LTI Systems, Determining System Function H(z).

Text Books:

1. A. V. Oppenheim, A. S. Willsky, with S. Nawab "Signals & Systems", 2nd Edition, Pearson Education, 2015.
2. S. Salivahanan, C. Gnanapriya, " Digital Signal Processing", Second Edition, McGraw Hill Education.
3. J. G. Proakis, D. G. Manolakis, "Digital Signal Processing, Principles, Algorithms, & Applications", 4th Edition, Pearson Education.

Reference Books:

1. Smarajit Ghosh,"Signal & Systems",Pearson Education.
2. Nagrath & R. Ranjan, "Signals & Systems", TMH.
3. Schaum Series, "Signals & Systems",Sue & Ranjan.
4. R.F. Ziemer, W.H. Tranter and D.R. Fannin, "Signals and Systems - Continuous and Discrete", 4th Edition, Pearson Educatio.
5. B.P. Lathi, "Signal Processing and Linear Systems", Oxford University Press, c1998.
6. Douglas K. Lindner, "Introduction to Signals and Systems", McGraw Hill International Edition
7. M. J. Roberts, "Signals and Systems - Analysis using Transform methods and MATLAB", TMH, 2003.

Course Outcomes:

At the end of this course students will demonstrate the ability to:

- Analyze different types of signals and systems.
- Represent continuous and discrete time signals and systems in time and frequency domain using different transforms.
- Get familiarized with the characteristics and applications of Linear Time Invariant System.
- Analyze LTI systems using Laplace/Z-Transform.