National Institute of Technology Meghalaya

An Institute of National Importance

CURRICULUM

Programme	**Bachelor of Technology in Electrical and Electronics Engineering**	Year of Regulation	**2019-20**
Department	**Electrical Engineering**	Semester	**V**

Course Code	Course Name	Credit Structure				Marks Distribution			
		L	T	P	C	INT	MID	END	Total
EE311	**Signals & Systems**	**3**	**0**	**0**	**3**	**50**	**50**	**100**	**200**

Course Objectives	Course Outcomes		
To make students familiar with the Signals and Systems, and aware about the implications of the properties of signals and systems.		CO1	**Able** to understand the concepts of trigonometry, complex algebra, signal classification, system classification, operations on signals and system and their properties
To learn time domain and frequency domain analysis		CO2	**Select** the methods, processes, techniques for time domain evaluation i.e. convolution, correlation, response analysis
To learn the different frequency transform techniques		CO3	**Frequency** domain analysis of continuous-time signals and systems, properties and characteristics
		CO4	**Integrate** transform strategies to analyze the signal more conveniently such as Laplace transform and z-transform
		CO5	Employ signal processing strategies, sampling, processing, signal construction
		CO6	

No.	COs	Mapping with Program Outcomes (POs)												Mapping with PSOs		
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	CO1	**1**	**2**	**1**	**2**	**1**	**1**	**0**	**0**	**1**	**1**	**0**	**1**	**1**	**1**	**1**
2	CO2	**2**	**1**	**2**	**2**	**1**	**1**	**0**	**0**	**1**	**1**	**0**	**1**	**1**	**1**	**1**
3	CO3	**2**	**2**	**2**	**1**	**1**	**2**	**0**	**0**	**1**	**1**	**0**	**1**	**2**	**2**	**2**
4	CO4	**3**	**3**	**2**	**3**	**1**	**2**	**0**	**0**	**1**	**1**	**0**	**1**	**2**	**2**	**2**
5	CO5	**3**	**2**	**3**	**2**	**1**	**2**	**0**	**0**	**1**	**1**	**0**	**1**	**2**	**2**	**2**

SYLLABUS

No.	Content	Hours	COs
I	**Basics of Signals and Systems** Classification of Signals, Operation on Continuous Signals and Discrete Signals, Properties of Signals. Classification of Systems and Properties of Systems.	**5**	**CO1**
II	**Linear Time-Invariant System** Discrete-Time LTI Systems: The Convolution sum, Continuous-Time LTI systems: The Convolution Integral, Properties of LTI systems. Representation of Causal LTI using Differential and Difference equations. Convolution of Finite Sequences, Correlation.	**5**	**CO2**
III	**Frequency Analysis of Signal and Systems** Frequency Analysis of Continuous-Time Signals, Frequency Analysis of Discrete-Time Signals, Properties of The Fourier Transformation For Continuous- time and Discrete-Time(DTFT) Signals, Frequency-Domain Characteristics of LTI Systems.	**7**	**CO3**
IV	**Laplace Transform** The Laplace transform, Properties of the Laplace transforms, Inversion of the Laplace transform, Analysis of Linear-Time-Invariant Systems using Laplace transform.	**7**	**CO4**
V	**Z - Transform** The z-transformation, Properties of the Z-Transformations, Inversion of the z-transform, The One-Sided Z-transformation, Analysis of Linear-Time-Invariant Systems in the Z-Domain.	**7**	**CO4**
VI	**Sampling** Sampling Theorems, Ideal Sampling, Impulse Sampling, Natural Sampling, Signal Reconstruction and Aliasing, Sampling of Band Pass Signal.	**5**	**CO5**
	Total Hours	**36**	

Essential Readings

1. Oppenheim Alan V, Wilsky Alan S. and Nawab Hamid S, "Signal and Systems", Pearson Educations, 2nd edition, 1996.
2. Proakis J. G. and Manolakis D. G., "Digital Signal Processing: Principles, Algorithms and Applications," Pearson Education, 3rd edition, 1996.
3. Oppenhein A. V. and Shafer R. W., "Discrete-Time Signal Processing," PHI, 3rd edition, 2010.
4. Tarun Kumar Rawat, "Digital Signal Processing," Oxford University Press, 1st edition, 2014.

Supplementary Readings

1. Lathi B. P, "Linear Systems and Signals", Oxford University Press, 2nd edition, 2006.
2. Stuller John Alan, "An Introduction to Signal and Systems", Thomson India Edition, 1st edition, 2008.
3. Roberts M. J. and Govind Sharma, "Fundamental of Signals and Systems", Tata McGraw-Hill, 2nd edition, 2017.