	National Institute of Technology Meghalaya An Institute of National Importance	CURRICULUM

Programme	**Bachelor of Technology in Electronics and Communication Engineering**	Year of Regulation	**2018 – 19**
Department	Electronics and Communication Engineering	Semester	**VIII**

Course Code	Course Name	Credit Structure				Marks Distribution			
		L	T	P	C	INT	MID	END	Total
EC 428	**Statistical Signal Analysis**	**3**	**0**	**0**	**3**	**50**	**50**	**100**	**200**

Course Objectives		Course Outcomes		
	This course introduces of concepts of statistical signal analysis		CO1	Able to explain basic constituents of a random variables
	This course introduces of stochastic processes and systems in signal analysis		CO2	Able to apply probability concepts in analysis of signals
	This course introduces of Wiener filtering and Kalman filtering in signal analysis		CO3	Able to apply probability concepts in designing of systems.
			CO4	Able to apply Wiener filtering and Kalman filtering in signal estimation and signal analysis

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	PSO4
1	CO1	**2**	**1**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**1**	**-**
2	CO2	**1**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**2**	**-**	**2**	**-**
3	CO3	**-**	**2**	**2**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**2**	**2**	**-**
4	CO4	**-**	**2**	**-**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**2**	**2**	**-**

SYLLABUS

No.	Content	Hours	Cos
I	Review of probability theory and random variables: Transformation (function) of random variables, Conditional expectation; Sequences of random variables: convergence of sequences of random variables	**06**	**CO1**
II	Stochastic processes: wide sense stationary processes, orthogonal increment processes, Wiener process, and the Poisson process, KL expansion.; Ergodicity, Mean square continuity, mean square derivative and mean square integral of stochastic processes	**12**	**CO2**
III	Stochastic systems: response of linear dynamic systems (e.g. state space or ARMA systems) to stochastic inputs, Lyapunov equations, correlational function, power spectral density function	**10**	**CO3**
IV	Introduction to linear least square estimation, Wiener filtering and Kalman filtering.	**08**	**CO4**
	Total Hours	**36**	

Essential Readings

1. Papoulis, “Probability, Random Variables And Stochastic Processes”, McGraw-Hill,4th Edition, 10th Reprint, 2006
2. William A. Gardner, "Introduction to Random Processes: with application to signals and systems", McGraw-Hill, 2nd Edition, 1989.
3. Larson H. J. and Shubert B. O., “Probabilistic Models In Engineering Science – Vol I, Random Variable and Stochastic Process, Vol II Random Noise Signals and Dynamic Systems”, Wiley Publication,1st Edition,1982.

Supplementary Readings

1. Hayes Monson H.,“Statistical Digital Signal Processing”, John Wiley,1st Edition,1996.
2. Montgomeri and Ruger,“Applied Statistics And Probability For Engineers”,John Wiley, 1st Edition,2006.
3. S. M. Kay, “Fundamentals of Statistical Signal Processing”, Prentice Hall, 1st Edition, Volume 1, 1993.