

Course Type	Course Code	Name of the Course	L	T	P	Credits
DP	NECC518	Signal Processing Lab	0	0	3	1.5

Course Objective
To understand software and hardware implementation of algorithms in statistical signal processing.
Learning Outcomes
<ul style="list-style-type: none"> • Implementation of statistical signal processing algorithms in matlab • Understanding applications of statistical signal processing • Understanding design trade-offs in signal processing

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	FIR Filter Design; IIR Filter Design; Evaluation of Power spectral density; System response to random inputs	9	Review of Digital Signal Processing
2	Implementation of linear prediction; Lattice filter structures	6	To understand implementation of linear prediction
3	Design of Matched filter; Design of Wiener filter	6	To understand design of optimum linear filters
4	Implementation of Least Mean Square (LMS) filter; Application of LMS filter;	6	To understand design of LMS filter
5	Implementation of Recursive Least Square (RLS) filter; Application of RLS filter;	6	To understand design of RLS filter
6	Implementation of Kalman filter	3	To understand implementation of Kalman filters
7	Non-parametric method for power spectrum estimation; Parametric method for power spectrum estimation	6	To understand implementation of power spectrum estimation methods
	Total	42	

Text Books:

- 1) Proakis, John G, Manolakis Dimitris G.. *Digital signal processing: principles, algorithms, and applications*, 4/E. Pearson Education India, 2007.
- 2) Proakis, John G, and Charles M.R.. *Algorithms for statistical signal processing*. Prentice Hall, London, 2002.

Reference Books:

- 1) Ingle, Vinay, Stephen Kogon, and Dimitris Manolakis. *Statistical and adaptive signal processing*. Artech, 2005.