13-EC530 **ADAPTIVE SIGNAL PROCESSING**

SYLLABUS

Complex-Valued Adaptive Signal Processing: Optimization in the Complex Domain, Widely Linear Adaptive Filtering, Nonlinear Adaptive Filtering with Multilayer Perceptrons, Complex Independent Component Analysis, **Robust Estimation Techniques for Complex-Valued Random Vectors**: Statistical Characterization of Complex Random Vectors, Complex Elliptically Symmetric (CES) Distributions, Tools to Compare Estimators, Scatter and Pseudo-Scatter Matrices Array Processing Examples, MVDR Beamformers Based on M-Estimators, **Turbo Equalization**: Communication Chain, Turbo Decoder: Overview, Forward-Backward Algorithm, Simplified Algorithm: Interference Canceler, Capacity Analysis, Blind Turbo Equalization, Convergence, Multichannel and Multiuser Settings, **Subspace Tracking for Signal Processing**: Linear Algebra Review, Observation Model and Problem Statement, Preliminary Example: Oja's Neuron, Subspace Tracking,, Eigenvectors Tracking, Convergence and Performance Analysis Issues, **Particle Filtering:** The Basic Idea, The Choice of Proposal Distribution and Resampling, Some Particle Filtering Methods, Handling Constant Parameters, Rao–Blackwellization, Prediction, Smoothing,

TEXT BOOKS

1. Tu¨lay Adalı ,Simon Haykin," Adaptive Signal Processing", John Wiley & Sons