

KL University
Department of Electronics & Computer Engineering
M.Tech (wcn) 2015-2017

Course Code : 15-EM52H1
Course Title : **Advanced Techniques for Wireless Reception**
Course Structure : 3-0-0
Credits : 3

SYLLABUS:

Unit-1:

Blind Multiuser Detection

Wireless signaling environment, Basic receiver signal processing for wireless reception-matched filter/raked receiver, equalization and MUD. Linear receiver for synchronous CDMA-decorrelating and MMSE detectors. Blind MUD, direct and subspace methods.

Unit-2:

Group Blind MUD

Linear group blind MUD for synchronous CDMA, Non-linear group blind multiuser detectors for CDMA-slowest descent search. Group blind multiuser detection in multipath channels-Linear group blind detectors.

Unit-3:

Space-Time MUD

Adaptive array processing in TDMA systems-Linear MMSE combining, sub-space based training algorithm and extension to dispersive channels. Optimal space time MUD. Linear space time MUD- Linear MUD via iterative interference cancellation, single user space-time detection and combined single user/multiuser linear detection.

Unit-4:

NBI Suppression

Linear predictive techniques-linear predictive methods. Non-linear predictive techniques-ACM filter, Adaptive non-linear predictor, Non-linear interpolating filters and HMM based methods. Code aided techniques-NBI suppression via Linear MMSE detector.

Unit-5:

Signal Processing for Wireless Reception

Bayesian signal processing- Bayesian framework, batch processing Versus adaptive processing, Monte-Carlo methods. Signal processing for fading channels. Coherent detection in fading channels based on EM algorithm. Decision feedback differential detection in fading channels-Decision feedback differential detection in flat channels, Decision feedback space-time differential decoding.

Textbook:

1. X.Wang and H.V.Poor," Wireless Communication Systems," Pearson,2004
2. Iti Saha Misra,"Wireless Communications and Networks,"Tata McGraw Hill,2009.
3. Doughas R.Stinson, "Cryptography-Theory and Practice," CRC Press,1995