(Elective IV)
Advanced Techniques for Wireless Reception

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- de correlating 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 multi user 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.

Text Books: