1

Multipath components –> time varying channel impulse response  
Delay spread  
power-delay profile  
Scattering function of wideband channel  
narrowband channel – in-phase & quadrature

2

Noise, interference, radio link  
channel capacity  
SNR,SINR  
Bit Error Rating  
Fading channels  
Doppler effect  
ISI

3

ISI  
Types   
zero forcing  
minimum mean square error  
Maximum likehood sequence estimation   
decision feedback equalizer

4

Shortly coding  
Convolutional code  
Viterbi

5

Shortly coding  
- Shannon channel capacity and coding gain  
Concatenated codes  
Turbo Codes  
 - Recursive Systematic convolutional coder  
 - Random coding

Low-Density Parity check Codes

6

Without adaptive modulation  
Rayleigh fading  
Adaptive modulation-  
 - Parameters to adapt  
 - Optimization criteria

7

Narrowband, wideband channel  
Multicarier modulation  
OFDM, symbol  
Orthogonal subcarriers  
Guard interval  
 - smother signal  
Miltipath exceed guard interval, doppler  
advantages  
Disadvantages

8

Superheterodyne receiver  
Phase locked loop System   
parameters  
Concept  
Design  
Reference frequency XTAL  
Up/Down conversion  
IQ Modulator  
Amplifiers  
Antena