

NEAR EAST UNIVERSITY

Electrical and Electronic “Engineering Department

Prof. Dr. Fahreddin M. Sadıkoğlu

Mobile Communication Systems –EE 429

Course Descriptions:

Fundamentals of Radio communications. Propagation loss and models. Cellular communications. Access technologies. Comparison of FDMA, TDMA and CDMA. Narrowband and wideband systems. Spectral efficiency. Geometry of hexagonal cells. Cochannel interferences. Cellular system design with omni directional and directional antennas. Cell splitting. GSM architecture and interfaces. GSM speech channels, logical channels and frame structures. Message, services and call flows Scenarios in GSM. Modulation, demodulation and speech coding in GSM. Privacy and security in GSM. Authentication. SIM cards.

Telecommunication traffic Engineering: Traffic analysis, Blocking formulas.

Course Grade Determination:

10% - Assignments ; 10% - Laboratory; 10% - Attendance; 30% - Mid -Term Exam; 40 - Final Exam;

References:

1. Siegmund M. et all. *An introduction to GSM*. Artech house publishers, 1995
2. Vilgay K. Garg. & Joseph E. Wilkes. *Principle and applications of GSM*. Printice-Hall, NJ, 1999
3. Theodores S. Rapparat. *Wireless Communication. Principle and Practice*. Printice-Hall, NJ, 2000
4. Carg V. K. & Wilkes J. E. *Wireless and Personal Communication Systems*. Printice-Hall, NJ, 1996
5. Simon Haykin, Michael Moher. *Modern Wireless Communications*. Printice-Hall, NJ, 2003

Weekly Schedule

Week	Subject	References
1	An overview of Mobile Communication systems	[4] ch.1
2	Acces technologies. Comparison. Spectral efficiency	[4] ch.3
3	The cellular concept. Channel assignment strategy. Geometry of hexagonal cells. Cochannel interferences.	[4] ch.4
4	Cell planning. Cellular system design with omni directional and directional antennas. Cell splitting.	[4] ch.4,
5	GSM architecture and interfaces.	[4] ch.5

6	GSM speech channels, logical channels and frame structures.	[4] ch.6,7
7	Message, services. Call flows Scenarios in GSM.	[4] ch.9, 10
8	Modulation, demodulation.	[4] Ch. 12
9	Speech coding in GSM.	[3] ch.8
10	Privacy and security in GSM. Authentication. SIM cards.	[4] Ch. 11
11	Multipath characteristics of radio-wave. Short and long terms term fading. Rayleigh and Rician fading. Doppler spread Propagation path loss.	[4] Ch. 18
12	Propagation models. Modeling for outside and inside environments. Delay spread.	
13	Telecommunication traffic Engineering: Traffic distribution and traffic measurement.Erlang's blocking formulas	[4] Ch. 18
14	Future wireless services	[4] ch.18