

## EE 463: Wireless Communications

### Second Semester (1437/38 H)

**Instructor Contact Information:**

Dr. Majid Altamimi      Office: 2C14  
Phone: 4678592      Email: [mtamimi@ksu.edu.sa](mailto:mtamimi@ksu.edu.sa)

**Course Pre-requisite:** EE 422 (*Digital Communications*) and EE 423 (*Wave Propagation and Antennas*)

**Textbook:**

T. S. Rappaport, *Wireless Communications: Principles and Practice*, Prentice Hall, Second edition, 2002.

**References:**

- 1- G. L. Stuber, *Principles of Mobile Communication*, 2<sup>nd</sup> Ed., Kluwer Academic Publishers, USA, 2002.
- 2- A. Goldsmith, *Wireless Communications*, Cambridge University Press, 2009.

**Course Outline:**

Ch # (Textbook)	Topics	Week #
1,2	<b>Introduction to Mobile Wireless Communications:</b> Overview of wireless communication systems, basic concepts, major problems and challenges.	1
3	<b>The Cellular Concept:</b> Frequency reuse, channel assignment strategies, handoff strategies, interference and system capacity, trunking and Grade of Service, improving capacity; cell splitting and sectoring, cell coverage analysis.	2,3,4
4	<b>Mobile Radio Propagation: Largescale Path Loss</b> Mobile radio propagation models; Path loss models, Shadowing.	5,6
5	<b>Mobile Radio Propagation: Small Scale Fading</b> Statistical fading models (Rayleigh, Rician, Nakagami). Mobile channel simulations.	7,8
6,7,8	<b>Link Performance &amp; Capacity, Error Mitigation Techniques for Mobile Radio:</b> Capacity of fading channels, Digital Modulation Performance in fading channels, Equalization, Diversity, and Channel coding techniques for mobile radio, MIMO systems.	9,10,11
9,10	<b>Access Techniques:</b> Multiple Access techniques (TDMA, FDMA, CDMA, SDMA, & OFDMA), capacity of cellular systems with TDMA, FDMA, CDMA, OFDMA.	12,13
11	<b>Wireless Systems and Standards:</b> Modern Wireless Systems and Standards; 1G, 2G, 3G, 4G+, wireless networks, Wi-Fi, WiMAX, and LTE.	14

**Grading Policy:**

- 10% Homework/Quizzes
- 10% Course Project
- 20% Mid-term Exam-I (7<sup>th</sup> week, Tue., 22/06/1438H, 21/03/2017)
- 20% Mid-term Exam-II (12<sup>th</sup> week, Tue., 6/08/1438H, 2/05/2017)
- 40% Final Exam

**Course Policy:**

- Students are expected to attend all classes and participate in all in-class discussions.
- Student should attend at least 75% of all lectures, to be able to write final exam.
- Students are responsible to follow all instructions, either oral or in writing, that are provided in the class.
- Homework is always submitted on time.
- Cheating on homework or in exam is NOT tolerated in any way.