Hashemite University
College of Engineering
Department of Electrical Engineering
EE 409433-Wireless Comm. Systems (3 Credit Hours/Dept. Compulsory)

Instructor

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Grading info

Test 1	
Test 2	
Term Project	
Final	

Class Info

Days	
Time	
Location	

Course

Course Number:	110409433
Prerequisite:	Digital Communications (110409432) - Knowledge of performance analysis of digital communication systems.
Textbook:	**"Wireless Communications: Principles and Practice"** Theodore Rappaport, 2nd edition, Prentice Hall, 2002.
Course Description:	Introduction to wireless communication systems and standards, principles of wireless communications, cellular concept, North American cellular system, GSM, spread spectrum, system design fundamentals (grade of service, channel capacity), mobile radio propagation (path loss models), fading and multipath, equalization and diversity, modulation performance in fading and multipath channels. A term project including a final report and a presentation are required.
Specific Outcomes of Instruction (Course Learning Outcomes):	1. Compute the number of users a particular system can accommodate.(a, e) 2. Design a system for increased capacity using trunking, cell splitting, directional antennas, etc. (c) 3. Determine the effect of multipath interference, large and small scale fading, reflections and attenuation, etc. on system performance.(a, e) 4. Compute and measure Raleigh and Rician fading channels.(a, e) 5. Analyze, and evaluate the performance of several digital communication systems such as BPSK, FSK,…ect.(a, e) 6. Calculate diversity and MIMO gains via maximal ratio combining and selection combining. (a, e) 7. Investigate the impact of existing wireless technology in a global, economic, environmental and societal context. (g, h, j)
Important material	- Lecture notes - References

References:

- **"Wireless Communications",** Andrea Goldsmith, Cambridge University Press; 1st edition, 2005.

Major Topics Covered and Schedule in Weeks:

Topic	# Weeks	# Contact hours
Principles of wireless communications	2	6
System design fundamentals (grade of service, channel capacity)	3	9
Large scale mobile radio propagation (path loss models)	3	9
Small scale multipath propagation and fading	4	12
Diversity, modulation performance in fading and multipath channels	3	9
Total	**15**	**45**

Course Policy

- If you miss class, there won't be a makeup test, quiz, etc. and you WILL get a zero unless you have a valid excuse.

- Cheating and plagiarism are completely prohibited.If you miss more than 15% of classes you will automatically fail the class.

#	*Outcome Description*	*Contribution*
(a)	an ability to apply knowledge of mathematics, science, and engineering	***M***
(b)	an ability to design and conduct experiments, as well as to analyze and interpret data	
(c)	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	***L***
(d)	an ability to function on multidisciplinary teams	
(e)	an ability to identify, formulate, and solve engineering problems	***H***
(f)	an understanding of professional and ethical responsibility	
(g)	an ability to communicate effectively	***L***
(h)	the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	***L***
(i)	a recognition of the need for, and an ability to engage in life-long learning	
(j)	a knowledge of contemporary issues	***L***
(k)	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	

H=High, **M**= Medium, **L**=Low