

## CPE/EE441: Introduction to Wireless Systems

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Textbook: Reading materials will be distributed

Other Recommended Readings:

Grading:

Class participation/Taking notes/Quiz 50%

HW 10%

Term paper/slides 20%

Group presentation 20%

Course Description: Review of history, concepts and technologies of wireless communications; Explanations and mathematical models for analyzing and designing wireless systems; Description of various wireless systems, including cellular systems, wireless local area networks and satellite-based communication systems; Wireless design projects including simulation using Matlab and experimentations using LabView, software defined radio, and RF transceivers.

Topical Outline:

Part 1: Introduction and overview  Overview of wireless communications Overview of wireless networking Overview of spread spectrum and CDMA Overview of OFDM	Part 2: Mathematical modeling and analysis  Probability distributions of fading signals Traffic modeling and statistics Signal outage and bit error rate analysis Packet transmission performance
Part 3: Wireless systems and applications  Second and third generation cellular systems Wireless LAN (802.11 versus HiperLAN) Globalstar, Iridium, and other LEOs Wireless multimedia applications Security and privacy in wireless networks	Part 4: Wireless design project and presentations  Wireless simulation using Matlab Measurement and analysis using LabView Use of wireless test bed Software defined radio (SDR)

CPC and APC

CPC (Curriculum Performance Criteria)	APC (Assessment Performance Criteria)
1A3: Relevance of mathematical results to physical applications	When exploring contemporary applications of science and engineering principles, the student will be able to understand their relevance of the mathematical principles to the application.
4B1: Design using appropriate input/output outcomes	The student will identify inputs and outputs in model development.
9C2: Presentations appropriate for audience/task	The student will be able to cogently develop ideas for presentation by clearly outlining the crucial concepts and ideas.
12A2: Following current professional literature	The student will be able to follow current professional literature in various media.