

Course Syllabus

Southeast Missouri State University

Department: Industrial and Engineering Technology

Course No.: ET-425/625

Title of Course: Wireless Communications and Mobile Data Networks Revision: New
Course Web URL (<http://cstl-pti.semo.edu/wu/et425>)

Instructor: Dr. Shuju Wu

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I. Catalog Description and Credit Hours of Course:

Topics in analog cellular phone systems (AMPS); digital cellular standards: GSM, IS-95; short message service (SMS); 2.5 G data services; cellular standards (CDMA 2000 and WCDMA/UMTS); Wireless LANs (IEEE 802.11); Bluetooth; Mobile IP; ad hoc and sensor networks. 3 credits hours. (2 hours lecture and 2 hours lab)

II. Prerequisite: ET375

III. Objectives of the Course:

1. To understand the principles of wireless communications.
2. To have a good insight in the significance that wireless systems and the user's mobility have on the construction and handling of a data or telecommunication network.
3. To understand the state-of-the-art technologies, concepts, protocols and design issues in current wireless communications and mobile data networks.

IV. Expectation of Students:

1. Students are expected read assigned materials.
2. Students are expected to complete all assignments. Assignments will ONLY be accepted on the due dates provided, unless previous arrangements are made or student provides a written medical doctor's excuse.
3. Students are expected to participate in class and group discussions
4. Student work will be completed in accordance with Code of Student Conduct (<http://www6.semo.edu/judaffairs/code.html>)
5. In a professional environment, work areas are kept clean. In keeping with a professional attitude towards fellow students, always clean your area before leaving.
6. All laboratory work must be completed during the regularly scheduled lab time.

V. Course content:

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| 1. Introduction, overview and organization of wireless networks (Characteristics of the wireless medium, propagation, transmission and multiple access). | 1 Week |
| 2. 1G and 2G cellular systems (AMPS, GSM, IS-95): mechanisms to Support a Mobile Environment Communications in the Infrastructure). | 2 Weeks |
| 3. 2.5G and 3G cellular systems (GPRS, EDGE, CDMA 200, CDMA/UMTS: Compatibility, internetworking, and voice/data convergence, explanations of how key standards and protocols intersect and interconnect). | 2 Weeks |
| 4. Wireless LANs (IEEE 802.11: historical overview of the LAN industry. Introduction to the PHY Layer. MAC Sublayer. MAC Management Sublayer). | 2 Weeks |
| 5. Mobile IP (Implementations of Mobile IP for mobile nodes, foreign agents, and home agents. Handling of packetized control data) | 2 Weeks |
| 6. Bluetooth technology (What is Bluetooth? Interference between Bluetooth and 802.11). | 2 Weeks |
| 7. Ad hoc and sensor networks (Protocols and algorithms to be used in ad hoc networks of mobile devices) | 2 Weeks |
| 8. Wireless networking security issues (Security threats and challenges in Wireless Networks, security mechanisms and protocols in wireless networks) | 2 Weeks |
| 9. Final Exam | |

VI. Textbook and Other Required Materials or Equipment:

Principles of Wireless Networks: A Unified Approach, Kaveh Pahlavan, Prashant Krishnamurthy. First Edition, ISBN: 0130930032, 2002

VII. Student Evaluation:

Grading Policy:

Undergraduate

- | | | | |
|-------------------------|------|------------|---|
| • Homework: | 20 % | 90-100 | A |
| • Labs: | 15 % | 80-89.9999 | B |
| • Class participation:* | 5% | 70-79.9999 | C |
| • Mid-term Exam: | 30 % | 60-69.9999 | D |
| • Final Exam : | 30% | < 60 | F |

Graduate

• Homework:	20 %	90-100	A
• Labs:	15 %	80-89.9999	B
• Class participation:*	5%	70-79.9999	C
• Mid-term Exam:	25 %	60-69.9999	D
• Final Exam :	25%	< 60	F
• Graduate Project	10%		

Graduate students will be required to complete a project relating to advanced topics in Wireless Communication and make a student presentation.

The weight of evaluation criteria may vary at the discretion of the instructor and will be indicated at the beginning of each course.

*: Participation to class discussions, taking labs, homework, and exams on the assigned time slots. The instructor reserves the right, acting within the policies and procedures of the university, to make changes in course content or instructional techniques without notice or obligation. No late assignments will be accepted. “**Emergencies**” require that YOU contact the instructor ASAP. Request for a late submission after the due time will not be granted.

VIII. Lab Rules and Safety Agreement:

Students must read, sign and follow the Laboratory Rules and Safety Agreement provided by the instructor.

IX. Academic Honesty:

Academic dishonesty is an offense against Southeast Missouri State University. A student who has committed an act of dishonesty has failed to meet a basic requirement of satisfactory academic performance. This academic dishonesty is not only a basis for disciplinary action, but is also relevant to the evaluation of the student’s level of performance.

Refer to: <http://www6.semo.edu/judaffairs/code.html>

X. Disabilities Statement:

If you have special needs addressed by the Americans with Disabilities Act and need special help, notify the university Learning Enrichment Center (573-651-2273) and your course instructor immediately if haven’t done so. Reasonable efforts will be made to accommodate your special needs.