

CS 422/EEE436 - Wireless Networking Technologies and Applications Spring 2010

Please note that if there is a difference between the information in this syllabus and the information posted on the website, you should take the information on the website as the correct one. The website will always include the most up-to-date information.

Course Description: The following are some of the topics that will be covered in this course with a project and hands-on oriented approach: wireless networking fundamentals, wireless medium access control, wireless LANs and 802.11, Bluetooth and WPANs, Zigbee/802.15.4, WiFi/Bluetooth/Zigbee coexistence, ad hoc networks, wireless and mobile routing protocols for ad hoc networks, wireless and mobile routing in Internet, Mobile IP, DHCP, NAT, wireless sensor and mesh networks, performance improvements for TCP performance in wireless networks and network security. Students will be given practical assignments that will be done using the equipments and software tools that will be provided by the instructors. In addition, students will be forming 3-4 member teams for completing a term-project, which will entail a wireless networking application or system design and development.

Tentative Lecture Schedule and Topics:

Week	Topic
1	Introduction to wireless networking
2	Wireless MAC
3	802.11 technology and CSMA/CA
4	802.11 planning, Bluetooth
5	Bluetooth, Zigbee and their coexistence with 802.11
6	Wireless and mobile routing - Ad Hoc Networks
7	Wireless and mobile routing/MobileIP/DHCP/NAT
8	Midterm
9	Wireless sensor networks
10	Wireless sensor networks (cont.); Localization
11	Wireless mesh networks
12	TCP and its congestion control algorithm
13	Improvements to TCP performance in wireless networks
14	Final presentations and demos (week of May 10, 2010); Final reports

Prerequisites: There are no prerequisites for this course. Knowing computing networking concepts, however, will be useful.

Course Website:

<http://www.cs.bilkent.edu.tr/~korpe/courses/wnta/>

Instructors:

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Teaching Assistants

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Grading Policy (tentative)

- Assignments: 10%
- Project: 60% (15% proposal, 15% progress reports, 10% final report, 20% final and midpoint presentations)
- Midterm: 15%
- Final: 15%

Assignments: There will be around three assignments that may involve experimentation, measuring, testing, planning, design, and programming.

Project: There will be one term-project spanning the whole semester. Interdisciplinary teams will be formed, and each group will do a different term project. For each group, a project topic will be determined, and a project proposal will be submitted by the group to the instructors.

Each group will be composed of 3-4 students. The groups will be interdisciplinary, i.e., contain a mixture of Computer Engineering and Electrical Engineering students.

The projects will be conducted by following these steps: 1) team formation, 2) project proposal submission, 3) design, development, tests, 4) demo/presentation, and 5) final report and/or paper submission. The demo and presentation will be open to public, other groups, faculty, and students. Following these steps in project development will help students to improve themselves, in proposing/defining projects, designing systems and protocols, and developing projects according to a design, and finally presenting their work in a effective manner, both by writing a final report and by presenting the project in front of an audience.

We plan to use the following schedule for the projects:

- Team formation: Week 3
- Project proposal submission: Week 5
- Weekly project progress report submission: Each team is required to submit a progress report each week describing the current status of the project. The report should describe the evolution of the project as well as the contributions of each team member.
- Final report/demo/presentation: Week 14

Project/Assignment/Exam Plan:

Week	
1	
2	List of project topics distributed
3	Assignment 1; Team formation
4	Inaugural group meeting
5	Project Proposal submission
6	Assignment 2; Feedback on project proposal
7	Progress report
8	Midterm
9	Progress report
10	Progress report; Assignment 3
11	Midpoint presentation and demo
12	Progress report
13	Progress report
14	Final report, Final presentation and demo (no class)
	Final exam