

ECE 850: Quality of Service in Wireless Networks Tentative Syllabus

Fall 2009

General Information

Instructor: Kuang-Ching Wang (kwang@clermson.edu)
308 Fluor Daniel Building, (864) 656-0846
Office Hours: Mondays 2 pm – 3 pm. Thursdays 2 pm – 3 pm.
Other times by appointment.
Lecture: Tuesdays and Thursdays, 3:30 – 4:45 pm, 226 Riggs.

Course webpage: <http://bb.clemson.edu>, <http://www.clemson.edu/~kwang/ece850/fa09>
Prerequisites: ECE 438/638 and ECE 440/640, or instructor's consent
Required text: Selected research papers.
Optional references: To be announced.

Course Description

Wireless networks have been an important part of our communication infrastructure. While wireless networks enable mobile, ubiquitous, and ad hoc communications, the unprotected wireless medium is prone to severe disturbances that affect the communications performances, namely, their quality of service (QoS). Tailored to their usage, communication QoS metrics can be defined and maintained via specialized mechanisms.

Offered in fall 2009, this course utilizes lectures, paper discussions, and a series of guided projects to introduce the protocols and mathematical foundations of the core QoS assurances techniques for Internet and wireless networks. The project components serve to establish student's ability in planning and conducting QoS analysis in wireless networks utilizing the ns-2 network simulator. By the end of this course, the students are expected to be able to:

- Identify and apply key models and mechanisms for QoS assurances in wireless networks.
- Identify, model, and analyze key sources of QoS dynamics in wireless networks.
- Identify, utilize, and analyze traffic engineering methods for QoS in wireless networks.
- Plan, implement, and conduct wireless network QoS experiments in the ns-2 network simulator wireless extension.

Tentative outline

Overview

1. Defining Network Quality of Service
2. From Internet to Wireless Networks

Core technologies

3. Integrated Services (queueing methods, network calculus, resource reservation)
4. Differentiated Services
5. Multi-Protocol Label Switching and Traffic Engineering
6. TCP variants
7. QoS support in WiMAX: a case study

QoS Measurement

8. Packet pair techniques
9. Wireless network measurement case studies

Mobility

10. QoS routing methods
11. QoS support for mobility

Evaluation (*Tentative allocation*)

Guided projects	30% Paper presentations	20%
Midterm exam	20% Term project	30%

Class Handouts

Assignments, solutions, and supplemental class notes will either be provided in class or made available on-line through Blackboard (<http://bb.clemson.edu/>). It is the responsibility of each student to download posted materials and announcements prior to each lecture.

Homework policy

Discussion among classmates on assignments and projects is allowed and encouraged. However, all programs and project reports handed in must be developed and written up by individual students unless otherwise specified. No copying of solutions from others is allowed, even if the solutions are obtained as a result of collaboration. Each assignment must be turned in at the start of class on the date it is due if not specified otherwise. Late assignments without prior instructor permission, except for unforeseen emergent reasons such as accidents supported by document, are not accepted. The instructor retains the right to deny any late turn-in requests; on accepted assignments, the instructor retains the right to deduct 20% penalty for each additional day.

Exam Policy

No make-up exams will be given unless an acceptable reason is presented to the instructor at least one week prior to the exam date. The final exam must be taken at the scheduled time.

Re-grade Policy

Any re-grade request of an assignment, project, or exam must be submitted in writing on a separate piece of paper within one day of return of the graded item. Students should not write any comments or marks on the graded item in question, or the re-grade will not be considered. The instructor retains the right to refuse a re-grade request turned in after the announced period.

Attendance Policy

Regular class attendance is strongly recommended. A student is responsible for all materials covered in class. Class cancellations will be announced in advance at the earliest possible time. In unusual circumstances that the instructor or a guest lecturer does not show up within 15 minutes, students may assume the class cancelled and leave.

Academic Honesty

The official statement of Clemson University on Academic Integrity: "As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a "high seminary of learning." Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form." Any such instances will be subjected to rulings set forth by the University.

Disability Services

The official statement of Clemson University on disability services: "It is University policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have disabilities. Students are encouraged to contact Student Disability Services to discuss their individual needs for accommodation."