CpE/Sys Engg/EE 443 Wireless Ad hoc and Sensor Networks

PROFESSOR: Dr. M. Zawodniok  SEMESTER: Fall 2008
OFFICE: 133 EECH  OFFICE HOURS: T Th 1pm-2pm (or by appt)
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CLASS TIME: Wed 4pm-6:30 pm  LOCATION: G14 Library


REFERENCE: Several IEEE Transactions and other international journals.

PREREQUISITES: CpE/EE/SysEng 348 (wireless networks), or CpE 349 or equivalent, and/or consent of the instructor

OBJECTIVES: 1. To understand the principles of ad hoc wireless and sensor networks.
2. To understand and design protocols including congestion control and routing.
3. To design, analyze and simulate high-speed networks and assess performance.
4. To implement protocols using hardware/motes.

GRADING: Mid-Term Examination: 50%
(3 exams, but the best two will be used toward final grade)
Homeworks 10%
Projects/Lab Assignments 15%
Final Project 25%

Grades will be based on the following percentage guidelines (standards will not be raised!):

>90% = A, 80 - 89% = B, 70 - 79% = C, 60 - 69% = D, < 60% = F

POLICIES: 1. No late homework will be accepted. No make ups will be given for missed exams without a verified medical excuse. A grade of 0 will be assigned to missed exams. Class attendance is expected. Please be on time.
2. Unless otherwise stated, homework and computer assignments must be done individually.
3. University policies regarding academic dishonesty will be implemented.

COURSE OUTLINE: (tentative--can change!!!)
1. Ad hoc Wireless and Sensor Networks: Introduction Week 1
2. Background on Dynamic Systems Week 2
3. Congestion Control in High-Speed Networks Week 3
   i. ATM Week 3
   ii. Internet Week 3,4
   iii. Admission control Week 5
4. Distributed Power Control and Rate Adaptation Week 6,7
   i. Cellular, peer-to-peer and ad hoc networks
   ii. Rate Adaptation Week 8
5. Distributed Fair Scheduling Week 8,9
6. Self Organization and Routing Week 10
   i. Optimal link state routing
ii. Optimal energy delay routing Week 11
iii. Self organization and energy delay subnet routing Week 12
7. Congestion Control in ad hoc wireless networks Week 12
8. Distributed Power Control for RFID networks Week 14

This intermediate level graduate course provides an authoritative treatment of ad hoc wireless and sensor networks, protocols, performance assessment and traffic management design tools. Performance modeling and estimation of model parameters will be discussed. Traffic management and routing schemes will be covered for wired and wireless networks. Design project/laboratory assignment/home works will include some design, simulation and performance assessment of ad hoc wireless and sensor networking protocols, traffic management and routing schemes using the NS or any network simulator.

COURSE UPDATES AND CHANGES ON BLACKBOARD

The Blackboard (http://blackboard.mst.edu or from the Blackboard link on the Missouri S&T homepage at www.mst.edu) will be used to post course materials including syllabus, class slides, assignments, and grades. Additionally, announcements and alerts will be sent by email (done through Blackboard) when applicable including class schedule changes, new assignment being posted on Blackboard.

All students are being assigned to following course on the Blackboard:
SY_ENG 443: WIRELESS AD HOC & SENSOR NTWKS (LEC 1DIS) FS2008

Please check that you are able to access the materials for the course.

REPORTS REQUIREMENTS

1. Submission of reports is expected in electronic format (PDF, Word files) via email or Digital DropBox at Blackboard. In special cases hardcopies will be accepted – please contact instructor to justify.

2. The assignment reports should be submitted using provided template (see Blackboard). It is not necessary to use all sections from the template.

3. The assignment reports should not exceed 6 pages. Penalty of 10% will be given for each page over 8 pages. For example, 9 page report will result in reduction of grade by 10%, the 13 page report will result in reduction of grade by 50%, for 18 page and longer report - 0 points!!! The appendixes (e.g. Matlab or Ns2 code/scripts) will not be counted toward the limit!!!

4. The students are required to discuss the results and explain the observed phenomena and changes in the results – simple description of the plots is not sufficient. The report with only results shown will receive maximum 50%. Please talk to the instructor in advance if you have questions or doubts.

5. The detailed requirements for project report will be given in separate document. The project will have mandatory sections and separate page limits.

DISABILITY SUPPORT

If you have a documented disability and anticipate needing accommodations in this course, I strongly encourage you to meet with me early in the semester. You will need to request that the Disability Services staff send a letter to me verifying your disability and specifying the accommodation you will need before I can arrange your accommodation.