

COT 6930: Advanced Computer Networking

Course Description

This graduate-level course covers advanced topics in computer networking, with emphasis on IP and wireless networks. Areas of interest include Quality of Service, ad-hoc wireless networks, sensor networks, peer-to-peer networks and delay-tolerant networks. The class has the format of a research seminar. We will read research papers and we will discuss them in class, analyzing proposed solutions, their drawbacks and looking for ways to improve them. There are two objectives for this course, to introduce some exciting areas in computer networks, and to learn to apply the methods of research.

Note for FEEDS Students:

This class requires students to attend (physically) the Boca Raton class *a few times* during the semester, to present research papers.

Required Textbook

No textbook is required. The course uses published research papers and surveys.

Recommended Books

The following texts provide a good background in computer networks, but are not required:

- A.S. Tanenbaum, "Computer Networks", 4th Edition, Prentice Hall, 2002
- Murthy & Manoj, "Ad Hoc Wireless Networks: Architectures and Protocols," ISBN 0-13-147023-X, Pearson 2004.

Instructor Information

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Class Time and Location:

MW, 3:30 pm - 4:50 pm, Boca Raton, Computing Bldg 125

FEEDS

Office Hours Location and Time:

Boca Raton, SE480: TBA

Prerequisites

CDA 4500 Introduction to Data Communications, or equivalent

Programming experience with C/C++ is a plus

Topic Areas

- Networking Basics
- Introduction to the *ns2* network simulator
- Quality of Service in IP Networks
- Routing and Topology Control in Ad-hoc Wireless Networks
- Issues in Wireless Networks with Intermittent Connectivity (aka. Delay Tolerant Networks, DTN)
- Peer-to-peer And Overlay Networks
- Wireless Sensor Networks

Course Workload

Term project. Student can pick one these two choices:

- Perform original research on a topic of student's choice. The research project should include network protocol/architecture design or a comparative performance evaluation, involving simulation or implementation. This project can be done individually or in a group of two students.
- Study an area in computer networking and write an in-depth survey paper.

Students must present their project in class.

Paper critiques. For each class students will read 1 or 2 research papers that will be discussed in that class and will submit a short critique ($\frac{1}{2}$ – 1 page per paper) before beginning of class. The assignment will be selected from the reading list posted on the course blackboard page. A critique should summarize the main contributions and evaluate weaknesses and strengths.

Topic presentation. Each student will present in class, at least once during the semester, the research paper(s) scheduled for that day. This will encourage discussion and will promote critical thinking.

Midterm exam and final exam.

Grading

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| Project: | 30% |
| Paper critiques, presentation, attendance: | 20% |
| Midterm: | 20% |
| Final: | 30% |