

ComS/CprE 454/554: Distributed and Network Operating Systems - Spring 2009

General Information

Instructor	Dr. Wensheng Zhang
Office	109 Atanasoff
Email	wzhang AT cs.iastate.edu
Phone	4-2821
Office hours	Tue 10:30am-12:00pm, Fri 2:30-4:00 pm, or by appointment via email
Class hours/Room	Mon/Wed 2:00-3:30pm/Gilman 1312
TA	TBA
Office	TBA
Email	TBA
Office hours	TBA

Course Description The purpose for this course is to help students to gain hands-on development and research experience on distributed systems. Specifically, students will learn the fundamental mechanisms of TinyOS/Mote platform and study the principles in designing distributed middleware on top of the TinyOS/Mote platform, through completing experimental projects. The lectures will include the following topics (tentatively):

- Introduction to distributed and network operating systems
- Basics of the TinyOS/Mote development/experiment environment
 - Design principle of TinyOS
 - nesC language and programming basics
 - Simulator and other development/experiment tools
- Basic mechanisms provided by TinyOS/Mote platform
 - Communication (inter-mote, mote-PC)
 - Storage management
 - Scheduling
 - Power management and resource arbitration
 - Multiple threads
- Principles for designing distributed middleware atop TinyOS/Mote platform
 - Time synchronization
 - Networking, clustering, inter-node scheduling
 - Data management
 - Security
 - Others

Prerequisites ComS 311, ComS 352, ENGL 105, SP CM 212

Textbook & References No textbook. References and handouts will be posted on the course website (WebCT). Course Schedule, handouts, homework assignment, discussion board, etc. are also available in WebCT

Programming Projects 3 small-scale programming projects will be assigned. Students are required to develop nesC code for Tiny OS/Mote, and do experiments to evaluate the design and to identify open issues. The code of each project shall be submitted by its deadline via WebCT, and students will meet with TA individually for demonstration. To finish a project, students can form groups, and each group cannot have more than 2 students.

Students can borrow notes from the instructor for projects and self-practice.

Exam There will one in-class exam scheduled at the middle of the semester. No final exam.

Term Project Student may choose one of the following options to do term projects:

- A creative/integrated software system: Applying hands-on experience gained in the class, each group (with up to four students) will design a creative and/or integrated software system that can be run on nesC/Mote (note: Desktop/laptop PCs may be a part of the system as well), along with a brief and well-documented description of design motivation, design principle, and user manual. Students are free to choose their topics, but the topic and the composition of groups should be approved by the instructor.
- Students may choose to do a survey paper or a research paper on one of the topics discussed in class or on other topics approved by the instructor. Each survey paper shall be an individual effort. Students may form groups (each with up to two students) on research papers if approved by the instructor. However, ONLY undergraduate students can choose to do survey papers.

Students need to prepare proposal, mid-term report and final report for their term projects.

Grading The grade will be based on:

- Programming Projects (15% each)
- Midterm (15% each)
- Term Project (35%) - Outstanding term projects may get bonus based on the judgments of the instructor.
- Participation (5%)

Others

Appealing policy: If you have questions regarding the grading of your projects or exams, you **MUST** come to see either the instructor or the TA **WITHIN TWO WEEKS** after the date your homework, projects or exams have been returned to you.

Late Policy: Homework and projects must be turned in before the specified due date and time. Late homework and projects will NOT be accepted.

Academic Honesty: **Each group must do their projects on their own!**

Disability Policy: If you have a disability and require accommodations, please contact the instructor early in the semester so that your learning needs may be appropriately met. You will need to provide documentation of your disability to the Disability Resources (DR) office, located on the main floor of the Student Services Building, Room 1076, 515-294-6624.