

ECE 555, Fall 2008

Real-Time Embedded Systems

Website: <http://www.ece.utk.edu/~xwang/ece555/>

Course Objectives:

This course introduces the design principles, analysis methods, and case studies of microprocessor-based real-time embedded systems. Topics include real-time operating systems, single-processor scheduling, multi-processor scheduling, distributed real-time embedded systems, quality of service, end-to-end processor utilization control, embedded middleware, power-aware computing, energy management, real-time communications, wireless sensor networks etc. The lectures are organized into two part: (1) introduction of basic principles based on textbooks, and (2) studies of state-of-the-art research papers.

In Fall 2008, this course has three sections: (1) real-time embedded systems, (2) power management, and (3) wireless sensor networks.

Class Schedule:

Tuesday and Thursday, 11:10AM - 12:25PM, Ferris Hall 511

Textbooks and/or Other Required Material:

1. Real-Time Systems, by Jane W. S. Liu, Prentice Hall (April 23, 2000), ISBN: 978-0130996510.
2. Research papers available on the course website

Instructor:

Dr. Xiaorui Wang

Office Hour: half hour after each class or by appointment, Ferris Hall 421

Phone: 974-0627. Email: xwang@ece.utk.edu

Topics Covered:

Process scheduling in OS
Real-time scheduling on single processors
Scheduling in distributed real-time systems
Control tutorial - CPU utilization control
End-to-end CPU utilization control
Decentralized utilization control
Energy-efficient real-time scheduling
Real-time applications
Performance management
Power control
Multi-core systems
Wireless sensor networks
Real-time communications

Prerequisites:

ECE 455. Note: students who did not take 455 before must talk to the instructor to get his permission before taking this course.

Grading Policy:

Homework (critique): 10%
Class presentation: 15%
Midterm exam: 10%
Final exam: 10%
Semester-long project: 50%
- Proposal: 5%,

- Midterm presentation: 10%
 - Final presentation: 15%
 - Final report 20%
- Participation: 5%

Disability Statement:

Any student who feels s/he may need an accommodation based on the impact of a disability should contact the Office of Disability Services at 865-974-6087 in Hoskins Library to coordinate reasonable accommodations for students with documented disabilities.

Academic Integrity:

All homework/critiques turned in for credit must be each student's own work. The project report must be the team's own work. Any violations will result in a *minimum penalty of a zero* on the given assignment.