Com S 552 Principle of Operating Systems (Spring 2012)

Course Credit: 3.0

Lecture Time: 3:40-5:00 pm Monday & Wednesday (tentative)
Lecture Location: TBD

Pre-requisite: Com S 352

Topics

- **Process Synchronization & Deadlock**
  Review and in-depth study of theories, mechanisms, algorithms and programming skills for process synchronization and deadlock prevention/avoidance/detection

- **Distributed Mutual Exclusion**
  Theoretical foundations of distributed systems: a variety of distributed mutual exclusion algorithms

- **Fault Tolerance**
  Failure models, process resilience, virtual synchrony, distributed commitment, etc.

- **Protection & Security**
  Information protection models; cryptography basics (private key cryptography, public key cryptography, authentication, digital signature, etc.); advanced cryptographic algorithms and applications (group signature, attribute-based encryption, blind signature, etc.)

- **Embedded OS: TinyOS**
  Basics of nesC language; design principles of execution model, threading, communication, storage management, power management, resource arbitration, etc.; reading/modification of OS source code; experimental platform

- **Virtualization & Cloud Systems**
  Xen hypervisor; cloud system concepts and examples; research topics on cloud systems

Course materials

- Lecture notes
- Reference textbook
- Technical articles from journals and conference proceedings
- Online materials

Score Allocation

- Class participation: 5%
- Three to four individual-effort assignments (small-scale algorithm design, programming, and/or experiment; paper readings): 30%
- One research-oriented group project (including proposal, midterm and final presentations of the project): 35%
- Two exams: 30%

Instructor

- Instructor Wensheng Zhang
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**Academic Honesty:** Homework assignments are individual efforts, not group efforts. While discussion of assignments with other students is encouraged, a level of discussion that produces identical work is prohibited.