

Florida International University  
School of Computing and Information Sciences  
**CIS 5931 – Special Topics on Virtualized Systems**  
**Spring 2009 Course Syllabus**

**Schedule:**

MWF 12:00PM-12:50PM, ECS 145

**Instructor:**

Prof. Ming Zhao  
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Office hours: TBD

**Text:**

Recommended book: “Virtual Machines: Versatile Platforms for Systems and Processes”, Jim Smith, Ravi Nair, Morgan Kaufmann, ISBN 978-1558609105.

Readings will also be based a collection of relevant technical papers.

**Prerequisites:**

Operating Systems Principles (COP 4610 or equivalent); Knowledge of computer architecture and networking; Experience with C/C++ programming.

**Description:**

Virtualization technologies allow the decoupling of the user-perceived behavior of hardware/software systems from their physical implementation. Techniques to virtualize the basic functionality of today’s typical computing systems – processing, data storage, and communication – are becoming pervasive in industry and are the topic of current research. This class will cover the basic concepts and principles of virtualization, as well as the mechanisms and techniques of building virtualized systems, from individual virtual machines to virtualized networked infrastructures.

**Assignments:**

This class will be highly research oriented. Each student will select a topic related to virtualization for term project, study the relevant materials, develop and implement a research idea, and in the end report and present the results. The instructor will meet with students on a regular basis to guide them through each step of this entire research process.

**Topics:**

Virtual machines (50%)

- Classic virtual machines
- Paravirtualization
- Hardware-assisted virtualization

Virtual networking (20%)

- Tunneling
- Overlay networks

Virtual storage (20%)

- File system level virtualization
- Block level virtualization

Applications (10%)

- Virtual machine based distributed computing
- Cloud computing

**Grading:**

Class participation: 10%, Homework: 10%, Exam: 30%, Project: 50%