CS2106

Introduction to Operating Systems

Lecturer

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Email to arrange for consultation

- Research interests: computer architecture, operating systems, DNA-based data storage
- Academic history: Univ. of Belgrade → Barcelona Supercomputing Center → EPFL → Univ. of Washington → Microsoft Research → NUS

Co-Lecturer

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Email to arrange for consultation

- A familiar face ☺
- This time ensuring that you do great in CS2106 tutorials

Course Objectives

- **Synopsis:**
  - Introduces **basic concepts** in operating systems
  - Focuses on these areas:
    - OS Structure and Architecture
    - **Process** Management
    - **Memory** Management
    - **File** Management
    - OS **Protection Mechanisms**

- **Objectives:**
  - Identify & understand major functionalities of modern operating systems
  - Able to extend and apply the knowledge in future related courses

Specific Learning Outcomes

- After this course, you should:
  - understand how an OS **manages computational resources** for multiple users and applications, and the impact on application performance
  - appreciate the **abstractions and interfaces** provided by OS
  - be comfortable in **writing multi-process/thread programs** and avoid common pitfalls such as deadlocks, starvation and race conditions
  - be comfortable **writing system programs** that utilize POSIX syscall for process, memory and I/O management
  - be able to **self-learn advanced OS topics**

Assessment Weightage

- Weightage for various components:
  - Participation in Tutorials: **5%**
  - Lab Assignments: **25%**
  - Midterm: **20%**
    - Date: **Sat, March 13 (Week 8)**
    - Timing: **10AM**
    - Online (LumiNUS quiz)
  - Final exam: **50%**
    - Tue, May 4th, 9AM

Assessment – Lab Assignments (25%)

- **Five Graded** Lab Assignments:
  - Done individually, or in **teams of two**
  - Each assignment spans 2 weeks
    - Simple exercise(s) related to the core problem (1%)
    - Complete the assignment (the remainder %)
  - Lab session for:
    - Clarify lab questions and clear doubt
    - Both weeks: Demo the simple exercise(s) to lab TA for the (1%)
    - You don't have to be in the same lab group as your teammate
    - Demoes are graded individually
  - Submit online - you can work from home
  - "Simple" programming questions:
    - **Linux on x86**, using C
- Put the theory in lecture into actual practice
  - Learn Linux (or Unix in general)
  - Learn to interact with OS or simulate aspects of OS

Assessment - Plagiarism

- NUS takes a **serious** stand on plagiarism cases
  - All lab assignments will be sent for plagiarism checks

- Plagiarism for lab assignment submission:
  - Every violation of the NUS academic conduct will be formally reported to the UG office

Resources

- Mainly on LumiNUS:
  - Workbins:
    - Lectures, tutorials and labs
  - Forums:
    - Lectures
    - Tutorials
    - Labs
    - General
  - Announcement
  - and ……

References

- Main ***supplementary*** text (not mandatory):
  - **Modern Operating Systems** (Edition 3+)
    by *Andrew S. Tanenbaum*
  - **Operating System Concepts** (Edition 8+)
    by *Abraham Silberschatz*, *Peter Baer Galvin* & *Greg Gagne*
  - **Operating Systems: Three Easy Pieces**
    by *Remzi H. Arpaci-Dusseau* & *Andrea C. Arpaci-Dusseau*
  - All three books can be found online!

- Lecture notes:
  - As self-contained as possible

Acknowledgement

- Many of the lecture materials are created by

  A/P Soo Yuen Jien

  - Lecture notes and tutorials reused with some changes