Operating Systems

2017

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Overview
How to get the most of the course

• Read ahead and use lectures to ask questions

• Take notes

• Do the coursework well. Straightforward - schedule smartly

• Exam questions are a mix of simple conceptual and challenging applied ones

• If you are struggling, ask earlier rather than later

• If you don’t understand – ask!
Course Aims

• Understanding the *concepts* that underlie OS

• Purpose, structure and functions of OS

• Illustration of key OS aspects by example
By the end of the course you should be able to

- Describe, contrast and compare differing structures for OSes
- Understand and analyse theory and implementation of: processes, resource control (concurrency etc.), physical and virtual memory, scheduling, I/O and files

In addition, during the practical exercise and associated self-study, you will:

- Become familiar (if not already) with the C/C++ languages, gcc compiler, and Makefiles
- Understand the high-level structure of the kernel both in concept and source code
- Acquire a detailed understanding of three aspects of the kernel
Course Structure

• Introduction: overview of OS
• Basic OS functions
• Process management: scheduling, concurrency
  – Scheduling: CPU utilization and task scheduling
  – Concurrency: mutual exclusion, synchronization, deadlock, starvation, etc.
• Memory management
  – Physical memory, early paging and segmentation techniques
  – Modern virtual memory concepts and techniques
  – Paging policies
• Storage Management
  – Low level I/O functions, high level I/O functions and filesystems
• Other topics to be determined, e.g. virtualisation.
Administrative Details

• Tom Spink (IF-1.46, tspink@inf.ed.ac.uk).
  – Co-lecturer
  – Designed coursework
  – Virtualisation

• TA: Frederico Pizutti (IF-1.07, s1580329@sms.ed.ac.uk)

• Out-of-class communication
  – Instructor/TA
  – Course mailing list: os-students@inf.ed.ac.uk
  – Q&A via Piazza
Administrative Details

- **When and Where:** (Semester 2)
  - Mondays and Thursdays, 9:00-9:50
  - Lecture venue: Meadows Lecture Theatre, MEDS

- **Course descriptor**
  - [http://www.drps.ed.ac.uk/15-16/dpt/](http://www.drps.ed.ac.uk/15-16/dpt/)

- **Course webpage**
  - [http://www.inf.ed.ac.uk/teaching/courses/os/](http://www.inf.ed.ac.uk/teaching/courses/os/)
  - Schedule w/ lecture slides, assignments, TA contact info, past exam papers, examinable material, etc.
Assessment

• Exam: **70%** and Practical exercise: **30%**
  – *Changed from last year*

• **3 practical exercises** (Coursework)
  – Part 1: Scheduler
    • Due: 4pm on Thurs, 2\(^{nd}\) Feb (10% of practical)
  – Part 2: Memory Management
    • Due 4pm on Thurs 9\(^{th}\) March (50% of practical)
  – Part 3: File System
    • Due 4pm on Thurs 30\(^{th}\) March (40% of practical)

• **Exam**
  – Past exam papers: [http://www.exampapers.ed.ac.uk](http://www.exampapers.ed.ac.uk)
Textbooks


- Most of the other major OS texts are also suitable.

- You are expected to read/know Silberschatz 9th edition.

- Slides are a supplement not a replacement for the book

- If in doubt, read the book!
Acknowledgment

Slides from many sources (ab)used in this course
Myungjin Lee/ Ed Lazowska/A. Silberschatz allowed use of teaching slides for this course.