Operating Systems

2018

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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
Course Outcomes

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, security
Administrative Details

- Tom Spink (IF-1.46, tspink@inf.ed.ac.uk).
  - Co-lecturer
  - Designed coursework
  - Virtualisation
- TA Frederico Pizutti (IF-1.19A, s1580329@sms.ed.ac.uk)
- TA Siavask Katebzadeh (IF-2.0 m.r.katebzadeh@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: Teviot Lecture Theatre, MEDS, Teviot

• Course descriptor
  – http://www.drps.ed.ac.uk/17-18/dpt/

• Course webpage
  – 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 three practical exercises: 30%
- **3 task practical exercise** (Coursework)
  - Task 1: Process Scheduler
    - Due: 4pm on Thurs, 1\textsuperscript{st} Feb (10 marks)
  - Task 2: Memory Allocator
    - Due 4pm on Thurs 8\textsuperscript{th} March (50 marks)
  - Task 3: File system
    - Due 4pm on Thurs 29\textsuperscript{th} March (40 marks)
- **Exam**
  - Past exam papers: [http://www.exampapers.lib.ed.ac.uk.ezproxy.is.ed.ac.uk/Informatics0405.shtml](http://www.exampapers.lib.ed.ac.uk.ezproxy.is.ed.ac.uk/Informatics0405.shtml)
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 of book
Acknowledgment

Myungjin Lee/ Ed Lazowska (Univ. of Washington) allowed use of teaching slides for this course.