

159.736 Advanced Operating Systems Paper Outline – 2014 Semester 1

MASSEY UNIVERSITY
COLLEGE OF SCIENCES

Paper Number & Title: Special Topic (Advanced Operating Systems)

Points Value: 15

Semester: S1

Campus: Albany

Mode: Internal

1 Paper Coordinator

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Other Contributing Staff : None

2 Aim

To study a modern operating system in detail.

To study the architecture of a mobile computing platform and the complete implementation of the Google Android operating system on that platform.

To learn to write applications for the Google Android platform.

Pre-requisites: C, C++ and Java programming ability and knowledge and familiarity with OS and network concepts.

3 Objectives/learning outcomes

On completion of this course, students should be able to:

- Describe the architecture of an ARM based mobile device.
- Use the git version control system for linux kernel development.
- Write a simple Linux device driver.
- Compile the Android user space.
- Write an Android system library.
- Write a non-trivial Android application.

4 Course outline

1. Hardware
ARM Architecture, Basic SoC Architecture, GPIOs, i2c, USB, SD, NAND.
2. The Linux Kernel
Interrupts, Platform drivers, Frame Buffer, Touchscreen, Modem Drivers, IPC & RPC, Power Management, File Systems.
3. Libraries
C Library, Multimedia, OpenGL-ES, Camera, Radio Interface Library
4. Applications
App Life Cycle, Activities, Intents, Intent Receivers, Services, Content Providers.
Drawing, OpenGL-ES, Views.

5 Lectures

The course will be presented as a mix of formal lectures, tutorials, demonstrations and discussions.

6 Assessment

Assignments: 65% (25%, 20% and 20%)

Three assignments will be given. Students are to submit their working code solutions electronically. For each assignment a recommended task will be provided but students are encouraged to put forward their own tasks. If a student wishes to submit a significant piece of practical work, assignments 2 and 3 may be combined.

Seminar: 20%

Students will choose a subject or problem related to the topic of advanced operating systems and Google Android in particular. Students then give a short presentation to the class together with a brief (no more than 8 pages) written report. A list of possible subjects will be given early in the course but students are welcome (and indeed encouraged) to propose their own topics.

Reading Notes: 15%

Students should keep a reading journal with rough notes about everything they have read along with lecture notes. This will be marked at the end of the semester.

7 Requirements to Successfully Complete the Paper:

A satisfactory performance in the coursework is required to pass this paper. Students **MUST** also participate in the seminar.

8 Course material

Course notes will be placed on the course web site

Web resources

· Course website: <http://cs-alb-pc3.massey.ac.nz>