

## Introduction

COMP3231/9201/3891/9283  
(Extended) Operating Systems  
Dr. Kevin Elphinstone

## Welcome to OS @ UNSW

## Course Outline

- Prerequisites
  - COMPXXXX Data structures and algorithms
    - Stacks, queues, hash tables, lists, trees, heaps,....
  - COMPXXXX Microprocessor and Interfacing
    - Assembly programming
    - Mapping of high-level procedural language to assembly language
    - Interrupts
  - We will be using the C programming language
    - The dominant language for OS (and embedded systems) implementation.
    - Need to understand pointers, pointer arithmetic, explicit memory allocation.

## Why does this fail?

```
void set(int *x, int *y)
{
    *x = 1; *y = 2;
}

void thingy ()
{
    int *a, *b;
    set (a,b);
    printf ("%d %d\n", *a,*b);
}
```

## Lectures

- Common for all courses (3231/3891/9201/9283)
- Mon, 2-4pm, Chemical Sc M17 (ex AppliedSc) (K-F10-M17)
- Thu, 3-4pm, Ritchie Theatre (K-G19-LG02)
- The lecture notes will be available on the course web site
  - Available prior to lectures, when possible.
  - Slide numbers for note taking, when not.
- The lecture notes and textbook are NOT a substitute for attending lectures.
  - Video might be.....
- Will attempt to have "video" available, barring technical hitches.

## Extended OS Comp3891/9283

- Thu 4-5pm
  - Civil Engineering G1 (K-H20-G1)
  - **starts in week 2**
- A combination of:
  - Examination of topics in more depth
  - Looking at research in area (past/present)
  - OS/161 internals in more depth
- Separate Assessment
  - 75%-ish of final exam common with base course
  - 25%-ish targeted to extended students
  - Parts of advanced assignments part of assessment
- Assumes the tutorials are not challenging enough
  - Effectively replaces the tutorial with extra interactive lecture.

## Tutorials

- Start in week 2
- No participation marks this year.

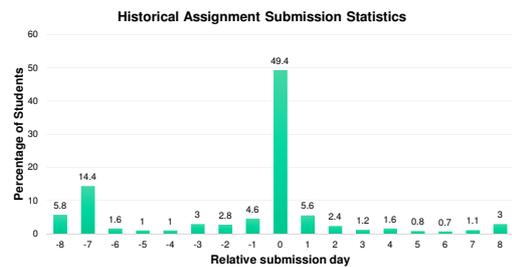
## Assignments

- Assignments form a substantial component of your assessment.
- They are challenging!!!!
  - Because operating systems are challenging
- We will be using OS/161,
  - an educational operating system
  - developed by the [Systems Group At Harvard](#)
  - It contains roughly 20,000 lines of code and comments

## Assignments

- Don't under estimate the time needed to do the assignments.
  - 80% is understanding
  - 20% programming
- If you start a couple days before they are due, you will be late.
- To encourage you to start early,
  - Bonus 10% of awarded mark of the assignment for finishing a week early
  - See course handout for exact details
    - Read the fine print!!!!

## Assignments



16% late

## Assignments

- Late penalty
  - 4% of total assignment value per day
    - Assignment is worth 20%
    - You get 18, and are 2 days late
    - Final mark =  $18 - (20 \times 0.04 \times 2) = 16$  (16.4)
- Assignments are only accepted up to one week late. >7 days = 0

## Assignments

- Warmup exercise (ASST0)
  - Bonus marks
  - Done individually
  - Available now!!!!
- Assignments are in pairs
  - Info on how to pair up available soon
- Additional, advanced versions of the assignment 2 & 3
  - Available bonus marks are small compared to amount of effort required.
  - Student should do it for the challenge, not the marks.
  - Attempting the advanced component is not a valid excuse for failure to complete the normal component of the assignment
- Part of the advanced assignments are part of Extended OS student's (COMP3891/9283) assessment
  - Not optional.

## Assignments

- Three assignments
  - due roughly week 6, 9, 13
- Also warm up bonus exercise due in week 4
  - It's a warm up to have you familiarize yourself with the environment and easy marks.
  - Do not use it as a gauge for judging the difficulty of the following assignments.

## Assignments

Submission test failed. Continue with submission (y/n)? y

- Lazy/careless submitter penalty: 15%
- Submitted the wrong assignment version penalty: 15%
  - Assuming we can validly date the intended version

## Assignments

- To help you with the assignments
  - We dedicate a tutorial per-assignment to discuss issues related to the assignment
  - Prepare for them!!!!

## Plagiarism

- We take cheating seriously!!!
- We systematically check for plagiarised code
  - Penalties are generally sufficient to make it difficult to pass
- We can google as easy as you can
  - Some solutions are wrong
  - Some are greater scope than required at UNSW
    - You do more than required
    - Makes your assignment stick out as a potential plagiarism case

## Plagiarism

- Avoid public github repositories!!
- Note: bitbucket.org has free academic accounts
  - Unlimited private repositories.

## Sample Cheating Statistics

Session	1998/S1	1999/S1	2000/S1	2001/S1	2001/S2	2002/S1	2002/S2	2003/S1	2003/S2	2013/S1
enrolment	178	410	320	300	107	298	156	333	133	108
suspected cheaters	10(6%)	26(6%)	22(7%)	26(9%)	20(19%)	15(5%)	???(?)	13(4%)	???(?)	18(16%)
full penalties (OFL)	2*	6*	9*	14*	10	9	5	2	1	0
zero for assignment										1
reduced penalties	7	15	7	7	5	4	2	2	9	16
cheaters who failed	4	10	16	16	10	12	5	4	?	1
cheaters suspended	0	0	1	0	0	1	0	0	0	0

\*Note: Full penalty 0 FL not applied prior to 2001/S1



## References

- A. Silberschatz and P.B. Galvin, *Operating System Concepts*, 5<sup>th</sup>, 6<sup>th</sup>, or 7<sup>th</sup> edition, Addison Wesley
- William Stallings, *Operating Systems: Internals and Design Principles*, 4th or 5<sup>th</sup> edition, Prentice Hall.
- A. Tannenbaum, A. Woodhull, *Operating Systems--Design and Implementation*, 2<sup>nd</sup> edition Prentice Hall
- John O'Gorman, *Operating Systems*, MacMillan, 2000
- Uresh Vahalla, *UNIX Internals: The New Frontiers*, Prentice Hall, 1996
- McKusick et al., *The Design and Implementation of the 4.4 BSD Operating System*, Addison Wesley, 1996

## Piazza Forums

- Forum for Q/A about assignments and course
  - Ask questions there for the benefit of everybody
  - Look there before asking
  - Apps for phone
- <https://piazza.com/>
  - Longer link on class web page
    - You will have received an invite from them to you cse email address.
    - Please join and contribute.

## Consultations/Questions

- Questions should be directed to the forum.
- Admin and Personal queries can be directed to me [kevine@cse.unsw.edu.au](mailto:kevine@cse.unsw.edu.au)
- We reserve the right to ignore email sent directly to us (including tutors) if it should have been directed to the forum.
- Consultation Times
  - See course web site.
  - Must email at least an hour in advance and show up on time.

## Course Outline

- “the course aims to educate students in the basic concepts and components of operating systems, the relevant characteristics of hardware, and the tradeoffs between conflicting objectives faced by operating systems in efficiently supporting a wide range of applications.”

## The End