

# CS2014

## Systems Programming

Lectures:

**Stephen Farrell**

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Room: WR3.4 (impossible to find!)

Teaching Assistant:

**Christian Cabrera**

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See Christian @ labs

# My Favourite LOC

```
#define malloc(__xxx__) \  
    (rand()%100<=30?0:malloc((__xxx__)))
```

# Administrivia (1)

- Lectures:
  - Tuesday, 1500-1550, RoomTBD
  - Wednesday, 1300-1350, RoomTBD
- Labs:
  - Thursday, 1200-1600, LG12
  - Labs are for you to do/get-help-with assignments (more on those in a second)
    - It is also just fine to work on the assignment on your own computing devices
  - There are more of you than there are seats in the lab, so...

# Administrivia (2)

- Lab slots:
  - Group 1: 12.00-12.50: Students whose surname begins with a letter between "O" and "Z".
  - Group 2: 13.00-13.50: Students whose surname begins with a letter between "I" and "N"
  - Group 3: 14.00-14.50: Students whose surname begins with a letter between "D" and "H"
  - Group 4: 15.00-15.50: Students whose surname has a prefix between "A" and "C"

# Administrivia (3)

- 2017 timing:
  - Lecture#1: September 26<sup>th</sup>
  - Week of November 13<sup>th</sup>: no lectures!!
    - TBD: Or maybe Christian takes those slots!!
  - Last lecture: December 13<sup>th</sup>
  - Last lab: December 14<sup>th</sup>
  - Last assignment due: Jan 15<sup>th</sup> (start of 2<sup>nd</sup> semester)
  - Exams: later (April/May)

# Administrivia (4)

- Exam/Assignments: 80/20

- That is: assignments are worth 20%
- You **MUST** pass both independently

```
int bummer=0; int pass;  
if (exam_mark < 0.4) {bummer=1;}  
if (assignment_mark < 0.4) {bummer=1;}  
if (!bummer) pass=1; else pass=0;
```

- There will be 6 marked assignments, each with a deadline

# Administrivia (5, and the last!)

- Assignment deadlines:
  - Assignment1: deadline 2017-10-09
  - Assignment2: deadline 2017-10-16
  - Assignment3: deadline 2017-10-23
  - Assignment4: deadline 2017-11-13
  - Assignment5: deadline 2017-12-04
  - Assignment6: deadline 2018-01-15

# Systems Programming: what's that?

- As always, it depends who you ask:-)
  - <https://duckduckgo.com/html?q=systems%20programming>
- Wikipedia definition#1 is most like this course, saying systems programming is lower level than application programming and can make assumptions about the system on which the code is run.
  - Often related to how the OS/system interacts with higher level code/users.
- DevOps trend though maybe changes this some: A lot of “systems programming” in future may involved python, Rust, Go, PHP/Node.js and JS etc as the boundaries between applications and systems blur.
- For now though, we'll stick with what Wikipedia says (today:-), on the basis that if you learn a couple of programming languages, the rest are mostly the same and you can learn them yourself later as needed (and fashions will change before you do that, probably;-)



# Course Content

- Introduction
  - A bit about using GNU/Linux
  - Various bits of C programming
  - Safety with dangerous implements
  - A touch of C++ programming
  - Something interesting for the end, that I've yet to decide upon
- 
- And 6 programming assignments

# What's our goal here?

- You'll learn C/C++ and a bit about the systems we use for doing assignments
- Higher level goal is that you can figure this stuff out for yourself when you later come across similar problems/challenges/opportunities:
  - On different systems
  - With different languages
  - Using different libraries
  - With or without handholding IDEs
- It is entirely fine that you have to look stuff up when you forget details, especially wrt APIs and libraries (I do that all the time)
  - Web search -> stackexchange etc. is almost entirely a fine thing
  - As always though, don't believe all you read

# What's our goal here?

- There are also even higher level goals...
- Being able to (figure out HOWTO) program gives you more potential to be an independent entity in this century's information-driven environment
  - It also gives you opportunities to help others, e.g. via OSS
  - This is not intended to (only:-) make you a more efficient corporate droid
- I claim: Widespread availability of flexible programming skills is a pre-requisite for defending freedom of expression and other human rights
  - See: universal declaration of human rights, esp. article 19.  
[https://undocs.org/A/RES/217\(III\)](https://undocs.org/A/RES/217(III))
  - Meeting minutes:-) <https://undocs.org/A/PV.183>

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#define malloc(__xxx__) \  
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```

- Let's shift from slideware to HTML:

<https://down.dsg.cs.tcd.ie/cs2014/examples/bm/README.html>