CS3021/3421 Computer Architecture II

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South Leinster St

STUDENTS

CS3021 BACS/MCS (≈100)

CS3421 BAI/MAI C, CD and D streams – optional (≈16)

Visiting students (≈??)

Why are there two different module codes??

INTRODUCTION

TIMETABLE SLOTS

- MON @ 10 LB08

- WED @ 3 M17

- THURS @ 10 LB08

- tutorials are aligned with lectures (no set tutorial slot)

- 5 or 6 tutorials

- start tutorials in class together, you must submit your answer using Blackboard by the following week and we'll try to return your mark within a week (pipeline)

- demonstrator yet to be allocated

SYLLABUS

- IA32 and x64 assembly language programming
- IA32 and x64 procedure calling conventions

- RISC vs CISC
- RISC-1 design criteria and architecture
- register windows and delayed jumps

- instruction level pipelining
- DLX/MIPS pipeline
- resolving data, load and control hazards

- virtual Memory
- memory management units [MMUs]
- multi-level page tables and TLBs
- MMU integration with an OS
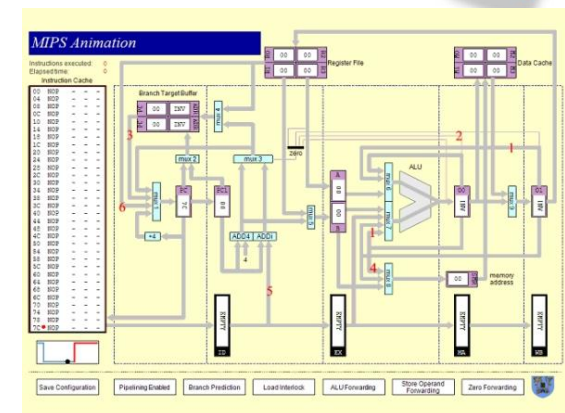
Syllabus ...

- cache organisation (L, K and N)
- cache operation and performance
- the 3 Cs
- virtual <u>vs</u> physical caches
- pseudo-LRU and LRU replacement policies
- address trace analysis

- multiprocessor architectures
- cache coherency
- cache coherency protocols [write-through, write-once, Firefly and MESI]
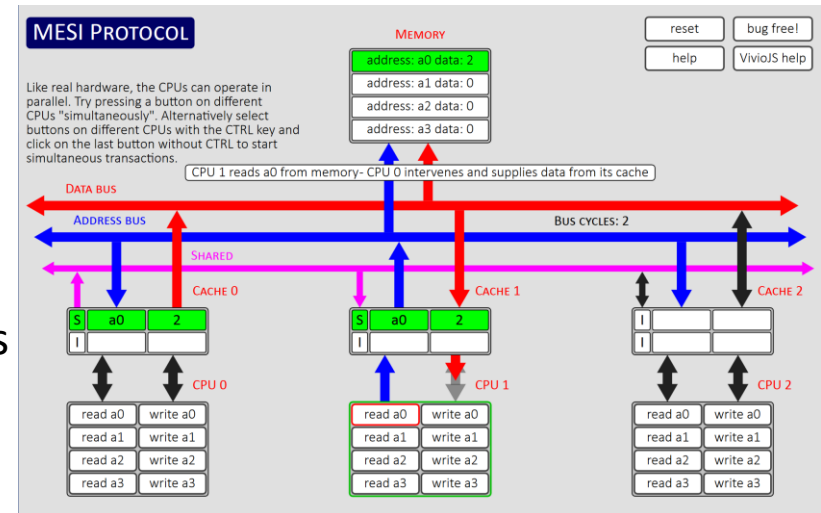
ASSESSMENT

Coursework: 20%

- 5 or 6 tutorials

Examination: 80%

- December 2018
- answer 3 out of 4 questions in 2 hours

Supplemental

- August 2019
- 100% exam (will incorporate a 20% coursework mark if it yields a better mark)

MODULE WEB PAGE

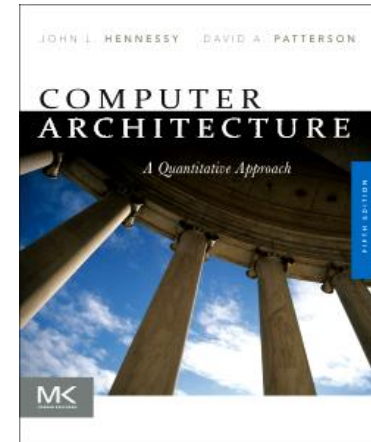https://www.scss.tcd.ie/Jeremy.Jones/CS3021/CS3021.htm

- lecture notes
- tutorials
- miscellaneous materials

- normally put lecture notes on web after every couple of lectures
- lecture notes can be read on a mobile phone
- you'll need web access to notes during tutorials

Useful Books

Computer Architecture - a Quantitative Approach
John Hennessey and David Patterson

High Performance Computer Architecture
Harold S. Stone
[for address trace analysis]

RECIPE FOR SUCCESS

- attend lectures

- keep up to date with the notes

- do the tutorials YOURSELF

- take pride in the tutorial answers you submit

- learn to use Visual Studio and VC++

Get Started on Wednesday @ 3pm M17

See you there!