CSU34021 Computer Architecture II

Prof Jeremy Jones

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O’Reilly Institute from Westland Row
STUDENTS

BACS/MCS (≈90)

BAI/MAI C, CD and D streams – optional (≈12)

Visiting students (≈??)
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 [Harshvardhan Pandit](mailto:Harshvardhan.Pandit@scss.tcd.ie)
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 vs 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 2019
• answer 3 out of 4 questions in 2 hours

Supplemental

• August 2020
• 100% exam (will incorporate a 20% coursework mark if it yields a better mark)
INTRODUCTION

MODULE WEB PAGE


- 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!