Course Goals

At the end of COMP1521, we hope that you ...

- can think like a **systems programmer**, with an understanding of the structure of computer systems;
- can describe how computers/programs work at a low-level, with a deep understanding of run-time behaviour; and
- are better able to reason about and debug your C programs

Major themes ...

- software components of modern computer systems
- how C programs execute (at the machine level)
- how to write (MIPS) assembly language
- Unix/Linux system-level programming
- how operating systems are structured
- introduction to concurrency, concurrent programming
- brief overview of virtual memory & caching

Course Syllabus and Topics

- the basic components of a (MIPS) CPU
- how to write programs in (MIPS) assembler
- how (C) data structures are represented at machine level
- how (C) programming language constructs are implemented as (MIPS) assembler
- bit-level operations
- representation of integers in fixed number of bits
- representation of reals in IEEE754 floating point on
- representation of characters as Unicode (UTF-8)
- systems programming, including:
  - file operations
  - processes
  - an introduction to threads/concurrency
Assessment

- 15% Labs
- 10% Weekly Programming Tests
- 15% Assignment 1 — due Monday week 7
- 15% Assignment 2 — due Monday week 11
- 45% Final Exam

... above marks may be scaled to ensure an appropriate distribution.

To pass, you must:

- score 50/100 overall
- score 18/45 on final exam

For example ... 55/100 overall, 17/45 on final exam ⇒ 55 UF not 55 PS

Assessment: Labs, Tests

- Labs, in weeks 1-5, 7-10:
  - max lab mark: 2 marks with challenge exercises
  - max lab mark ~1.6 marks without challenge exercises
  - labs marks summed and capped to give mark /15.
  - you can get 99% for lab mark without challenge exercises
  - expectation: most people will get 12+/15

- Tests, in weeks 3...10:
  - max test mark 1.7
  - best 6 of 8 test marks summed and capped to give mark /10.
  - expectation: most people will get 7+/10

Past Paper: Previous Final Exam

- A previous COMP1521 Final Exam will be available later tonight!
- Will be announced on Edstem.
- You can complete it as a practice exam. Autotests available.
- Sample answers released Friday 12th August, 12:00pm
- 22T2 exam will use a format similar for at least some questions.
The 22T2 Final Exam

- Exam will be **Thursday 18 August 09:00 — 12:00** Sydney time
- Exam will be released on class web site at **08:50**, allowing you some time to read the paper.
- You will be emailed a link just before 08:50
- Announcements before and during exam will be sent to your UNSW email.
- Questions during exam can be sent to **cs1521.exam@cse.unsw.edu.au**
- You will not be able to ask question in the class forum
- We will place copies of emailed announcements in the class forum
  - as an alternative for students whose email is not working
- Should look a lot like a weekly test...
  - except three hours long, with more questions and a different difficulty curve

**Exam Conditions**

During the exam...
- you must not communicate with anyone via any medium, except for COMP1521 staff;
- you must not get help from anyone during this exam, except for COMP1521 staff;
- you must not use code-synthesis tools;
- you must not communicate your exam answers to any other person, even after the end of the exam.

This is an open-book examination:
- you may use your papers or books; you may refer to the course website.
- You may access the internet in a read-only fashion.
- You may not create or modify materials on the Internet.

UNSW has exam prep materials about open-book examinations — student.unsw.edu.au/open-book-and-take-home-exams

**Deliberate violation of exam conditions will be treated as serious misconduct.**

**Exam Format**

- 8-15 questions ... not of equal difficulty, not necessarily worth equal marks.
- Each question answered in a separate file.
- Some questions may involve writing programs ...
  - some questions may ask you to write C;
  - some questions may ask you to write MIPS;
  - other languages not permitted (e.g., Python, C++, Java, Rust, ...)
- Some questions may not involve coding ...
  - some questions may ask for a short answer,
  - similar to tutorial questions.
- Answers will be submitted with give.
For questions that require you to write C or MIPS ...

- Questions will usually include examples.
- You may, or may not, be given starting code, test data, or other files.
- Autotests may be available on submission for some questions. **Passing autotests does not guarantee any marks**, do your own testing.
- There may be no submission tests for some questions.
- It is not sufficient to match any supplied examples.
- Questions may specify additional restrictions or limitations imposed on your program.

**Programming Questions — Assessment and Marking**

- Answers will be run through automatic marking software.
  - Please follow the input/output format shown exactly.
  - Please make your program behave exactly as specified.
- Answers that don’t pass all automatic marking tests are hand marked, guided by automarking.
  - No marks awarded for style or comments ...
  - But a human marker will be reading your program.
  - Comments only necessary to tell the marker something.
- Minor errors will result in only a small penalty.
  - E.g., an answer correct except for a missing semi-colon would receive almost full marks.
- No marks will given unless an answer has a substantial part of a solution (> 33%).
- No marks just for starting a question and writing some code.

**Exam Format — Non-coding Questions**

- Answers must be an specified file, e.g. `q1.txt`
- Question may specify format of file:
  - E.g., 5 integers, one per line ...
  - Follow this format **exactly**
- Question will give you an initial file to complete.
- Submit completed file with `give`.
Special Exam Conditions

- Any extra time specified in your ELS exam conditions is allowed in this exam.
- All students see the same exam question text.
- The text shows the standard exam deadline, any extra time is additional to it.
- *give configured to know about extra time ...*
  should show a deadline that *includes* your extra time
- email `cs1521.exam@cse.unsw.edu.au` immediately during exam
  if you have concerns regarding ELS conditions
- If ELS conditions prevent you taking exam, let us know.
  Likely outcome: supp in T3 week 0.

Exam clashes

UNSW policy is that you may be required to take two exams in one day.
Exams Unit generally don’t consider all-day exams a clash and special consideration is not generally offered.
If you think you may have an exam clash with overlapping time periods, let us know.

If It All Goes Wrong...

If a problem occurs during the exam, e.g., internet failure:
- Please document the problem as much as possible; e.g., take screenshots
- email `cs1521.exam@cse.unsw.edu.au` ASAP
  - follow any instructions given (e.g. “move to a different question”, “stop the exam”, “submit a special consideration application”).
  - keep us updated as the situation evolves (internet returns, computer reboots. etc).
- you have to contact us (`cs1521.exam@cse.unsw.edu.au`) IMMEDIATELY not an hour later
- When possible have a backup plan:
  - If VScode is down use VLAB.
  - If VLAB is down use SSH, or work local and copy across once the issue is resolved.
- If there is an issue with a question:
  - refresh the exam page (it might have already been fixed).
  - email us `cs1521.exam@cse.unsw.edu.au`.
  - move to a different question.

If the problem is of short duration, we may be able to give you extra time.
Otherwise, you will need to apply for special consideration.
Special Consideration ("Fit-to-Sit")

This exam is covered by UNSW’s Fit-to-Sit policy.

By starting the exam, you are saying “I am well enough to finish the exam.”

- If you are unwell before the exam: see a doctor, apply for Special Consideration.
- If you become unwell during the exam: email cs1521.exam@cse.unsw.edu.au ASAP.
  - If you cannot continue the exam, you will need to see a doctor, and apply for Special Consideration.

What should you study for?

- Important Areas to Focus Your Study On...
  - anything covered in a standard lab exercise
  - anything covered in a weekly test
  - anything covered by the assignments
- Less Important Areas
  - may still be questions on these topic but not many
  - challenge lab exercises
  - topics not covered in labs, tests or assignments
  - complex aspects of creating processes / threads
- Explicitly not assessed
  - Caching
  - Virtual memory

Timeline: Provisional Results

- Marking will take time — likely 10-12 days.
- When marking is complete, exam marks will be available via class marks database.
  I’ll send email announcing this.
- You will receive marks for individual exam questions.
- You will have an opportunity to have your marking reviewed.
- Final results will appear on myUNSW.
  T2 Release of Results: Friday 26 August.
Supplementary Assessment

- If you miss the original exam due to illness/misadventure, you may be eligible for a supplementary exam; apply for special consideration. Schools and individual courses cannot offer supps.
- Students with borderline results are **not** offered supps. (... except potential graduands.)
- Similar format to final exam.
- Supp exams centrally timetabled for sometime near T3 week 0.

What did you like?

One aim of COMP1521 is to give a taste of many topics:

- liked MIPS, Assembly?
  ⇒ COMP3222, COMP3211 ...
- curious about programming languages?
  ⇒ COMP3131, COMP3141, COMP3161, COMP6991, ...
- liked operating systems?
  ⇒ COMP3231/3891, COMP9242, ...
- liked concurrency?
  ⇒ COMP3151, COMP3153, COMP6721, COMP6991, ...
- liked *nix shell?
  ⇒ COMP2041

Upcoming Course Offerings (2022 - 2023)

- COMP1531: Software Engineering Fundamentals
  22T3, 23T1, ...
- COMP2511: Object-oriented Programming
  22T3, 23T1, ...
- COMP2521: Data Structures and Algorithms
  22T3, 23T1, ...
- COMP3231: Operating Systems
  COMP3891: Extended Operating Systems
  23T1,
Thanks to:

- Our wonderful teaching staff
  - Tutors
  - Lab assistants
  - Forum staff
  - Help session teachers
  - Content improvers
  - Assignment authors
  - Assignment markers
- All of you!

myExperience

- How did we do?
- What worked well?
- What could we do better?
- Let us know: myexperience.unsw.edu.au
- myExperience incentive…?

And that’s all!

Good Luck!

- I hope what you’ve learnt in this course will be useful.
- I hope you get the mark you’re aiming for!