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 (not on exam)
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 as floating point (IEEE754)
- 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

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
Pass Requirements

- this is a required course for EE students
  - future study of EE students less heavily on COMP1521 than computing students
  - minimum pass standard set lower to recognise this
- Andrew manually inspects exam & other work of students below pass threshold
  - if students who look to have understood basic course material not passing
    exam mark or other components will be scaled up
- COMP1521 is a hard course, but in recent terms pass rate is same as average for level 1 UNSW courses
Labs, in weeks 1-5, 7-10:
- max lab mark each week
  - 1.6 marks without challenge exercises
  - 2 marks with 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 each week:
  - 1.7 marks
- best 6 of 8 test marks summed and capped to give mark /10.
- expectation: most people will get 7+/10
Final exam in CSE labs - **Thursday 04 May**
- closed book exam — no materials allowed.
- but you will have access to online language cheatsheets, documentation & man pages
  - same as weekly tests

**Morning & afternoon sessions**
- You have been asked to indicate preference (preference form closes tomorrow)
- We will be allocated you to preferred session if possible
- You will receive an e-mail with a link to your allocation by Friday Week 11

**afternoon session starts before morning session finishes**
- not permitted to leave morning session early
- not permitted to start afternoon session late
- afternoon session allocation will indicate a regular room
- afternoon session people accompanied to lab after morning session finishes

**a few students can not attend either session (COMM1140 or MATH2871 students)**
- you have your email about an alternate exam (sent earlier today (20th April))

**a few students still overseas and can’t return in time for the exam**
- will be offered alternate exam after return to Australia for T2
- monitor your email
Exam Conditions

- UNSW on-campus exam rules apply
  - see https://www.student.unsw.edu.au/exam/rules
- including:
  - bring your student card (other photo-id if student card lost)
  - phone, smart watch, other electronic devices switched off in your bag
  - you may bring clear water bottle
  - you can not bring your own keyboard/mouse or other hardware
- Deliberate violation of exam conditions will be treated as serious misconduct.
Exam Environment

- Restricted exam environment - not your CSE account
  - similar to default CSE lab environment

- No access to internet

- No access to your files
  - no editor configuration files!
  - Syntax highlighting has been added for you
  - Gedit, Vim, Emacs, Nano, VSCode, all provided as editors: pick your favourite

- Standard CSE lab machine commands available
  - including dcc, mipsy, mipsyweb, man
8-15 questions ... *not* of equal difficulty, *not necessarily* worth equal marks.

- generally, easier questions are towards the start of the exam, harder questions towards the end.
- but difficulty is subjective, so you might find that some questions are easier than earlier questions.

Each question answered in a separate file.

Most questions will involve writing programs ...

- some questions may ask you to write C (a .c file);
- some questions may ask you to write MIPS (a .s file);
- other languages *not* permitted (e.g., Python, C++, Java, Rust, ...)

It's Possible that some questions may not involve coding ...

- questions could ask for a short answer,
- similar to tutorial questions.

Answers will be submitted with *give*. 
Exam Format — Programming Questions

For questions that require you to write C or MIPS ...

- Questions will include examples.

- You may, or may not, be given starting code, test data, or other files.
  - If you are not given starting code, you must create your own files.
  - The name of the file will be specified in the question.

- Autotests may be available for some questions.
  
  **Passing autotests does not guarantee any marks**; do your own testing.

  There may be no submission tests for some questions.

- If autotests are available they will run on submission
  
  - This will be disabled in the last ~10 minutes of the exam.
    - So that submissions are faster to process.

- It is *not* sufficient to match any supplied examples.

- Questions may specify additional restrictions or limitations imposed on your program.
  
  - You must follow these restrictions or limitations otherwise you will not receive any marks.
  - Questions with additional restrictions will be hand-marked to ensure you have followed them.
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.
    - and you need to read your program
    - so use reasonable style, variable names, ...
  - comments only necessary to tell the marker something.
  - do not include your name in comments

- 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 generic code.

- Zero marks for submitting starter code even if it passes some autotests.
Each question will specify a file to write your answer in.

Answers must be in the specified file, e.g. `q1.txt`

Question may specify format of file:
- e.g., 5 integers, one per line ...
- follow this format `exactly`

Questions will give you an initial file to complete.
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.
  - if in doubt ask exam supervisor
- Email cs1521@cse.unsw.edu.au if you have concerns regarding ELS conditions
- If your ELS conditions prevent you from taking the exam, let us know.

https://www.cse.unsw.edu.au/~cs1521/23T1/
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.

We know about 7 students taking COMM1140 or MATH2871

- offered exam at later date (check your email)
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:
  talk to an exam supervisor ASAP.
a previous Final Exam paper will be released next Monday (24th)
- announced on class forum.

You can complete it as a practice exam.
- Autotests will be available.
- Submitting your answers with give will not work.

Sample answers released next Friday (28th)

23T1 exam will use a format similar for at least some questions.

The Practice Exam from the week10 Lab will not be released outside of the lab.
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 topics but not many
  - challenge lab exercises
  - topics not covered in labs, tests or assignments
  - complex aspects of creating processes / threads
Marking will take time — likely 10-12 days.

When marking is complete, exam marks will be available on the course webpage “marks” page. We’ll send email (Ed Announcement) announcing this.

You will receive marks for individual exam questions.

You will have an opportunity to have your marking reviewed.
  
  marks are reviewed if there is an issue with the marking not because you disagree with the mark you received.

Final results will appear on myUNSW.
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 will be 23T2 week 0 in CSE labs
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
COMP1521 — The Bad

- too little time - too many interesting topics
  - no coverage of caching
  - no coverage of virtual memory
  - no time to explore file systems
- some tuts and labs need refresh/update
- Labs: a lot of work, but hopefully you learned a lot
- Assignments: a **lot** of work, but hopefully you learnt a lot
Many lab exercises and test questions ... do you agree?

- Tutors and teaching staff
- Students
Thanks to:

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

- All of you!
How did we do?
What worked well?
What could we do better?

Let us know: myexperience.unsw.edu.au

Please give your tutors feedback. myExperience is the best way to give them feedback.
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!