

COMP1521 21T2 — Course Introduction

<https://www.cse.unsw.edu.au/~cs1521/21T2/>

Convenor,

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Students in this course have (mostly) completed:

- COMP1511 or COMP1911

Everyone has learned *fundamental C programming*.

COMP1511 also studied *linked lists, ADTs ...*

since not everyone has seen these, we won't use them

For this week's tuts and labs:

- review/strengthen assumed C knowledge

COMP1511/1911 ...

- gets you thinking like a *programmer*
- solving problems by developing programs
- expressing your solution in the C language

COMP1521 ...

- gets you thinking like a *systems programmer*
- with a deep understanding of run-time behaviour
- and better able to reason about your C programs

These are *not* the same goals as COMP2121.

COMP1511/1911 vs COMP1521

COMP1511/1911 ...



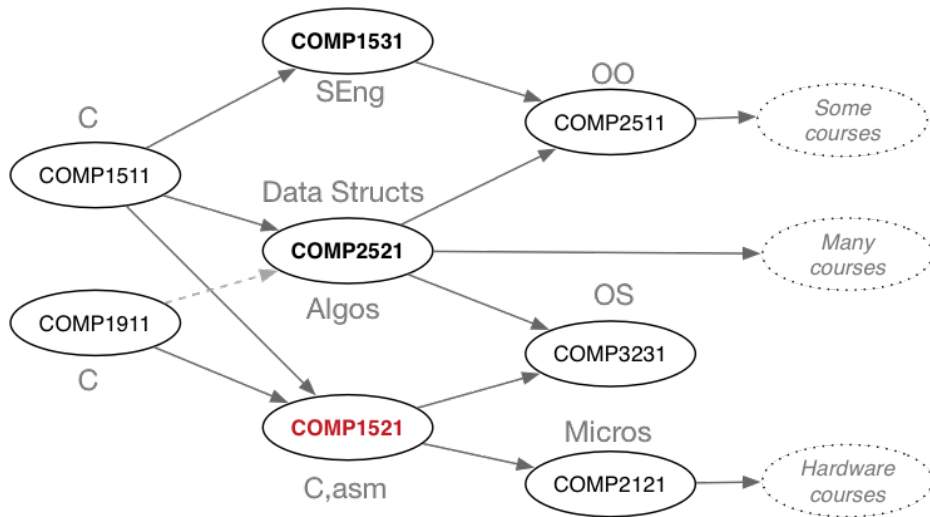
COMP1521 ...



or maybe ...



Course Context



Major themes ...

- 1 software components of modern computer systems
- 2 how C programs execute (at the machine level)
- 3 how to write (MIPS) assembly language
- 4 Unix/Linux system-level programming
- 5 how operating systems are structured
- 6 introduction to concurrency, concurrent programming

Goal: you are able to understand execution of software in detail.

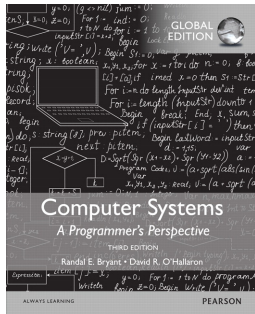
There is no prescribed textbook for COMP1521.

Recommended reference ...

Computer Systems: A Programmer's Perspective,
Bryant and O'Hallaron

- covers most topics, and quite well
- but uses a different machine code

Available in UNSW Bookshop



There is no prescribed textbook for COMP1521.

Material has been drawn from

- *Introduction to Computing Systems:
from bits and gates to C and beyond*,
Patt and Patel
- *The Elements of Computer Systems:
Building a modern computer system from first principles*,
Nisan and Schocken
- COMP2121 Course Web Site, Parameswaran and Guo

Always give credit to your sources!

Prac work based on *Linux* tools

- all tools available on the *CSE lab machines*
- can use *VLAB* to connect to CSE from home

Compilers: `dcc` on CSE machines (clang or gcc elsewhere)

Assembly language: MIPS on QtSpim (also Xspim on CSE)

Use your own favourite text editor

Other tools: `make`, `gdb`, `man`, `bc -l`

Learn to love the *shell* and command-line ... very useful!

- Wednesday, 14:00—16:00; Thursday, 12:00—14:00;
delivered via YouTube (and via Microsoft Teams Live Events)
 - you will have email about how to access the event
 - feel free to ask questions via chat
 - lectures recorded and linked from course home page.
- present a brief overview of theory
- focus on practical demonstrations of coding
- demonstrate problem-solving (testing, debugging)
- lecture slides available on the web before lecture.

- COMP1521 has 3 hour tut-labs starting week 1
- all timeslots have online classes
- delivered via Blackboard Collaborate
- many timeslots have *face-to-face* classes
- please follow UNSW policy: <https://www.covid-19.unsw.edu.au/>
- ensure you swipe your student card when directed

To get the best out of tutorials ...

- attempt the problems yourself beforehand
- ask if you don't understand a question or how to solve it
- Do *not* keep quiet in tutorials ... talk, discuss, ...
- Your tutor may ask for your attempt to start a discussion.

Each tutorial is followed by a two-hour lab class.

- Several exercises, mostly small coding tasks
- Build skills needed for assignments, exam
- Done individually
- Submitted via `give`, before Monday 21:00
- Automarked (with partial marks) — 15% of final mark
- Labs may include challenge exercises ...
 - may be silly, confusing, or impossibly difficult
 - almost full marks (95+%) possible
without completing any challenge exercises

From week 3, weekly tests:

- immediate reality-check on your progress.
- done in your own time under self-enforced exam conditions.
- time limit of 1 hour
 - can keep working after hour for 50% of mark
- automarked (with partial marks)
- best 6 of 8 tests contribute 10% of final mark
- any violation of test conditions \Rightarrow zero for whole component

Assignments

- Ass1: Assembly Language, weeks 4–7, 15%
- Ass2: C Programming, weeks 7–10, 15%
- Assignments give you experience with larger programming problems than lab exercises
- Assignments will be carried out individually.
- They *always* take longer than you expect.
- Don't leave them to the last minute.
- There are late penalties applied to maximum marks, typically 2%/hour

CSE offers an inclusive learning environment for all students.

In anything connected to UNSW, including social media, these things are student misconduct and will not be tolerated:

- racist/sexist/offensive language or images
- sexually inappropriate behaviour
- bullying, harassing or aggressive behaviour
- invasion of privacy

Show respect to your fellow students and the course staff

Cheating of any kind constitutes academic misconduct and carries a range of penalties.

Please read course intro for details.

Examples of inappropriate conduct:

- groupwork on individual assignments (discussion OK)
- allowing another student to copy your work
- getting your hacker cousin to code for you
- purchasing a solution to the assignment

- Labs, tests, assignments must be entirely your own work.
- You can not work on assignments as a pair or group.
- Plagiarism will be checked for and *penalized*.
- Plagiarism may result in suspension from UNSW.
- Scholarship students may lose scholarship.
- International students may lose visa.
- Supplying your work to any another person may result in loss of all your marks for the lab/assignment.

- online practical exam (you complete from home)
- limited on-line language documentation available
- some multiple-choice/short-answer questions, similar to tut questions.
- some questions will ask you to read C or assembler
- most marks for questions which ask you to write C or assembler
- also may ask you to answer written questions
- you must score 18+/45 on the final exam to pass course

- 15% Labs
- 10% Weekly Programming Tests
- 15% Assignment 1 — due week 7
- 15% Assignment 2 — due week 10
- 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 \Rightarrow **55 UF** not 55 PS

How to Pass this Course

- coding is a *skill* that improves with practice
- the more you practise, the easier you will find assignments/exams
- do the lab exercises
- do the assignments *yourself*
- practise programming outside classes
- treat extra tutorial questions like a mini prac exam

Assumed Knowledge

Assumed knowledge —

- design an algorithmic solution
- describe your solution in C code, using ...
 - variables, assignment, tests (`==`, `!`, `<=`, `&&`, etc)
 - `if`, `while`, `for`, `break`, `scanf()`, `printf()`
 - functions, `return`, prototypes, `*.h`, `*.c`
 - arrays, structs, pointers, `malloc()`, `free()`

Not assumed knowledge —

- linked structures, file operations, ADTs, sorting,
- *recursion*, *bit operations*