Software Design and Architecture

(OO Design & Programming)

Course Introduction

Term 2, 2025

UNSW SYDNEY

Our Team

Course Convenor and Lecturer [Week 01 to 05]:

Dr Ashesh Mahidadia (a.mahidadia@unsw.edu.au)

Lecturer [Week 07 to 10]:

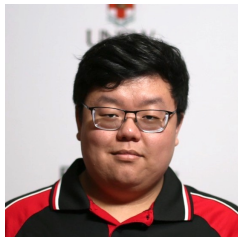
Dr Jesse Laeuchli (j.laeuchli@unsw.edu.au)

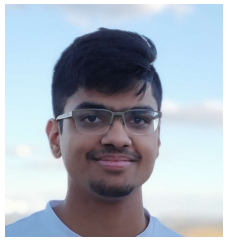

Ashesh


Jesse

Course Admin Team:

Alvin Cherk, Sai Nair, Michael Mospan, Grace Kan, Daniel Khuu


Alvin

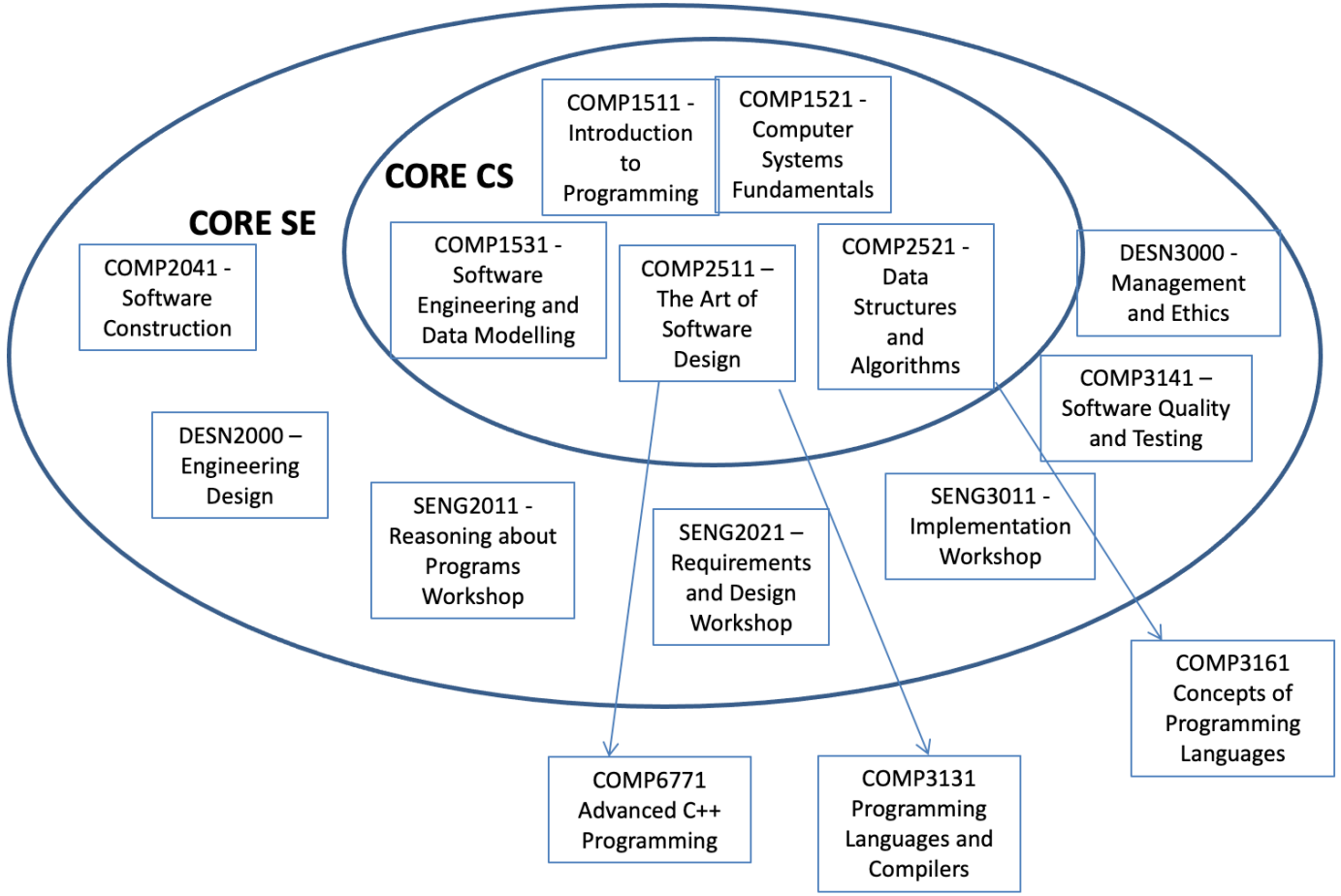

Sai

Tutors:

25+ passionate tutors!

Course Account Email: **cs2511@cse.unsw.edu.au**
*(Unless you specifically require to contact a member of the admin team, please use the **above email** for any queries related to the course.)*

Course Context



The Story So Far: Course Context

COMP1511: Solving problems with computers, the wonder and joy of programming

COMP1521: Getting right down into the silicon

COMP1531: Solving problems in a team; programming in the large

COMP2521: Solving problems at scale using data structures and algorithms

COMP2511???

COMP2511

- We can write code, but how do we write good code?
- Designing elegant and beautiful software.
- Shades of Grey - things aren't clear cut; writing good software is an art.
- Grow from a programmer into a software engineer by following a systematic design and development strategy.

COMP 2511 Major Themes

- Analyse characteristics of elegantly written software, and learn how to create and maintain well-designed codebases
- Apply widely used Software Design and Architectural Patterns to create extensible, flexible, maintainable and reusable software systems
- Apply the principles of Object-Oriented Design to solve problems.

COMP 2511 Major Themes

- Create medium-scale systems from scratch, and work on existing systems as part of the Software Development Life Cycle.
- For specific software development scenarios, evaluate different design and architectural paradigms and methodologies based on their origins and suitability.
- Create software solutions using an enterprise programming language within an integrated development environment (IDE).

Credit teaching material

- No textbook, the lecture slides cover the required topics.

- However, you are strongly encouraged to read additional material and the reference books.

- In the lecture notes, some content and ideas are drawn from:
  - *Head First Design Patterns* , by Elisabeth Freeman and Kathy Sierra, The State University of New Jersey
  - *Head First Software Architecture*, by Raju Gandhi, Mark Richards, Neal Ford, O'Reilly Media, Inc.
  - *Fundamentals of Software Architecture*, 2nd Edition, by Mark Richards, Neal Ford
  - *Refactoring: Improving the design of existing code*, by Martin Fowler
  - Material from many popular websites.

How do we obtain our educational objectives?

- Lectures: 4-hour lectures (9 weeks)

- Tutorials:
  - A 1-hour tutorial session per week, which is scheduled before the lab.
  - Online Tutorials/Labs will be run via **MS Teams** .
  - Tutorials are understanding-driven - interactive examples to illustrate concepts discussed in lectures
  - Solutions and recording to tutorials posted at the end of each week

How do we obtain our educational objectives?

- Labs:
  - 2 hours each week, straight after tutorial
  - Like most CSE core courses
  - Lab retros posted after due date on course website
  - Online Run via MS Teams

Assessments

Coursework (15%)

- Your coursework mark is made up of marks associated with the lab exercises.
- There are **seven** labs, each worth **ten** marks.
- We will cap total coursework marks at 60 (which will translate to 15%), leaving one lab as a buffer.
- If you attend all seven labs, we will add all seven lab marks and cap the total coursework marks to 60.
- The specific marking criteria for each lab will be outlined in the respective specifications.
- A general guide for the criteria that your tutor/lab assistant will use to assess you is available on the class webpage.
- You (students) must get your lab **manually marked** each week

Assignment I (15%)

- The marking criteria for the assignment will be outlined in the specification which will be released Tuesday of Week 2.
- Due Friday 3pm Week 5.
- Completed **individually**.

Assignment II (20 %)

- The marking criteria for the project will be outlined in the specification which will be released Thursday Week 5.
- **Pairs** formed within your tutorial.
- Groups formed by end of Week 3.
- Due Friday 3pm week 10
- If you're facing challenges with your partner, measures are in place to assist you. However, please ensure your tutor is informed as soon as the issue arises.

Final Exam (50%)

- In 25T2 the COMP2511 exam will be **held in person in the CSE Labs, and invigilated**.
- **All** students are required to take the **final exam in person**, even if they have enrolled in online classes. In 25T2, there will be no online exams.
- ***Hurdle*** : In order to pass the course, it is required for the student to achieve a **minimum of 40%** (20 out of 50) marks **in the final examination**.

- Students are eligible for a Supplementary Exam if and only if:
  - Students cannot attend the final exam due to illness or misadventure. Students must formally apply for a special consideration, and it must be approved by the respective authority.

Assumed Knowledge

- Confident programmers
  - Familiar with C and Python/JS programming concepts
- Able to work in a team
  - Git
  - Working with others
- Understand basic testing principles
- Understand basic software engineering design principles (DRY, KISS)

Assumed Knowledge

- What we don't assume:
  - Knowledge of Java
  - Understanding of Object-Oriented Programming

- **This is not a Java course**

Course philosophy

- A step up from first year courses
- Challenging but achievable
- Develop skills in time management, teamwork as well as critical thinking
- Highly rewarding

Support

- Supporting you is our job :)
- Help Sessions
  - Lots of them with fantastic tutors
  - Feedback on work, help with problems, clarifying ideas
  - You are expected to have done your own research and debugging before arriving

Support

- Course Forum
  - Ask questions and everyone can see the answers!
  - Make private posts for sharing code
  - Response time

- Course Account - cs2511@cse.unsw.edu.au
  - Sensitive/personal information

- During the project - your tutor
- Go to help sessions for help on concepts
- Post on the forum if you need more immediate lab feedback
- There are no late extensions on labs unless in extenuating circumstances, email cs2511@cse.unsw.edu.au

Support - UNSW

- **Special Consideration** - https://student.unsw.edu.au/special-consideration

- **Equitable Learning Services** - https://student.unsw.edu.au/els

Mental Health & Wellbeing

- UNSW Psychology & Wellness - https://student.unsw.edu.au/mhc
- UNSW Student Advisors - https://student.unsw.edu.au/advisors
- Reach out to us at cs2511@cse.unsw.edu.au
- Check in with each other
- Talk to someone

Technology Stack

- Java Version – JDK 17
- VSCode
- Gradle 8.8
- Gitlab (+ CI pipelines)

Feedback

- We love feedback :)
- Changes made to the course this term based on constructive student feedback
- We always want to continuously improve
  - This term, we are incorporating software architecture topics to enhance the course's relevance to real-world applications.
- Feedback form
- Course account

Respect

- Yourselves, each other, course staff

It's time to lift off for 25T2 !!!!