COMP2511
The Art of Software Design
(OO Design & Programming)

Course Introduction

Term 2, 2022

Our Team

Ashesh Mahidadia

Nick Patrikeos

Lecturer-in-charge:
Dr Ashesh Mahidadia <ashesh@cse.unsw.edu.au>

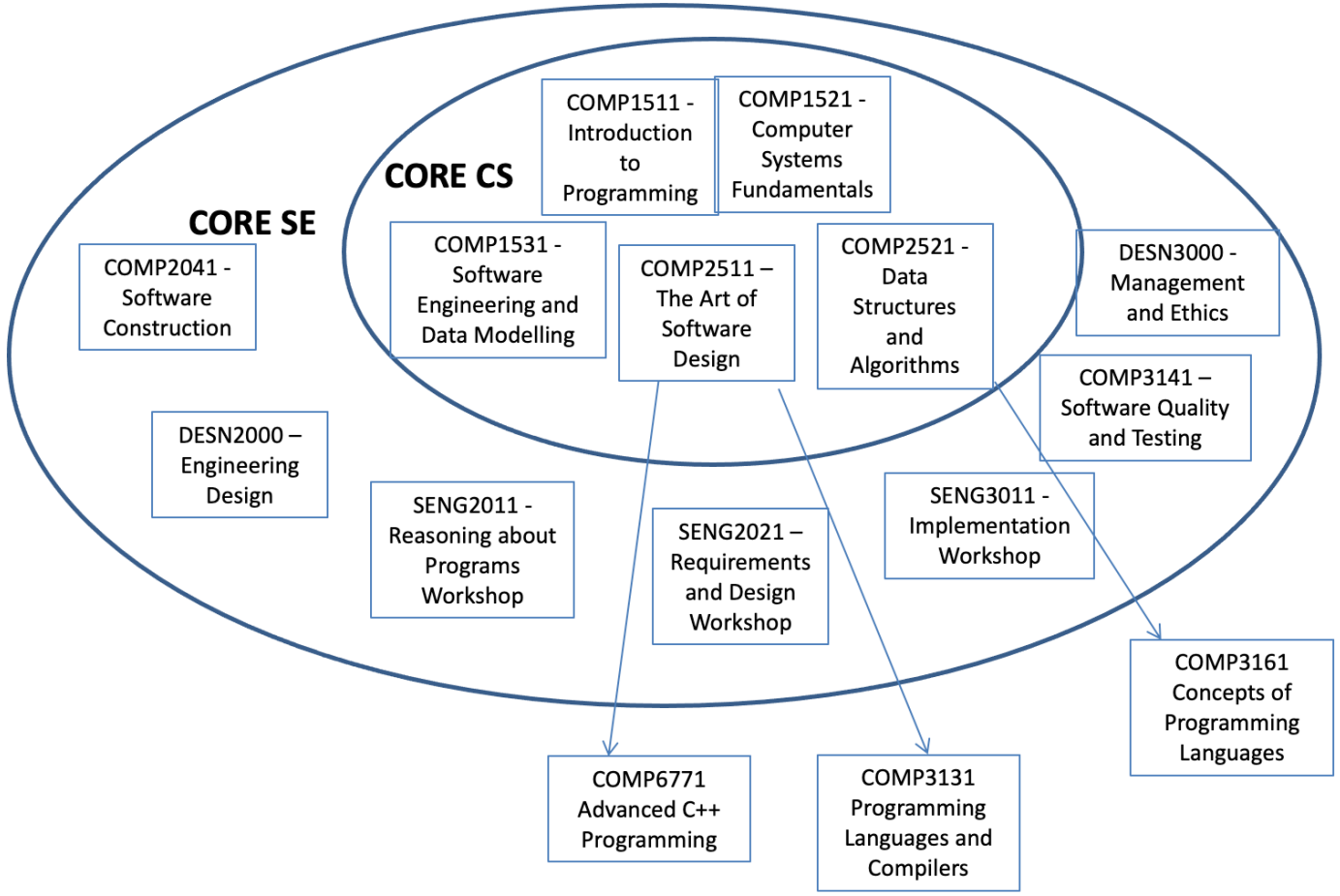
Course Admin:
Nick Patrikeos <n.patrikeos@unsw.edu.au>,

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.)*

Class Web: http://webcms3.cse.unsw.edu.au/COMP2511/22T2/

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
- From programmers to designers.

COMP 2511 Major Themes

- Develop an appreciation for elegantly written software, and how to create and maintain well-designed systems;
  - Apply principles and patterns to effectively design **flexible**, **maintainable** and **reusable systems**
- Understand different design paradigms and methodologies, their background and application;
  - Object-Oriented Paradigm
  - Functional Paradigm
  - Concurrent Paradigm (introduction)

COMP 2511 Major Themes

- Understand and apply the principles of Object-Oriented Design to solve problems;
  - Be able to follow a **systematic** OO Design process
  - Be able to interpret and use tools for OO Design
- Understand the role of and apply widely used Design Patterns to create extensible designs
  - Behavioural patterns
  - Structural patterns
  - Creational patterns
  - Programming patterns (exceptions, generic programming)
  - Testing patterns

COMP 2511 Major Themes

- Develop skills in both creating medium-scale systems from scratch, and working on existing systems as part of the Software Development Life Cycle;
  - Be able to analyse, refactor and work with code started by someone else
  - Create medium-scale systems using Java

- Work with an enterprise programming language and IDE
  - Java language
  - VSCode IDE

Credit teaching material

- No text book, 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
  - *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 contribute to your class marks.
  - You will receive mark out of two for each tutorial. A number of factors contribute toward you receiving a high grade in this area, including but not limited to:
    - Attending the full tutorial
    - Asking good and logical questions throughout the tutorial
    - Taking initiative to answer questions and be engaged
  - What if I can't make it?
  - 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
- ❖ Similar to most CSE core courses
- ❖ Online Run via MS Teams
- ❖ **Weeks 1 - 4**:
  - Lab marking: Tutors will mark your completed labs
  - Help/assistance with labs/assignment
- ❖ **Weeks 5 - 10**:
  - Lab marking
  - Project check-ins: Group mentoring sessions with your tutor
  - Weeks 8 + 10: Demonstrations of milestone submissions

Assessments

Class Mark (15%)

- Your class mark is made up of marks associated with tutorials and lab exercises.
- .Your final class mark is out of 60 marks.
- Each week, there will be 8 marks of core activities available in the form of:
  - Tutorial attendance and participation (2 marks)
  - Design and programming lab exercises (6 marks)
- Your class mark for each week will be out of 8. We will take your **best seven labs** towards your class mark, meaning that you are able to forfeit one week's labs without losing any marks towards the overall Class Mark.
- The final class mark will consist of:
  - Seven Tutorials/Labs : **56 marks** (7 tut/labs * 8 marks)
  - Only Tutorial participations: **4 marks** (2 marks for tutorial participation in Week 9 (when there is no lab) , 2 marks for tutorial participation in the week the lab was missed)
  - Total class marks = 56 + 4 = **60 marks.**
- There are additional choice activities which students may complete if they wish.
  They are non-assessable.

Tutorials

To receive 2/2 for weekly tutorial participation, you will need to:

- Attend the full tutorial
- Ask good and logical questions throughout the tutorial
- Take initiative to answer questions and be engaged
- If a you cannot attend an in-person tutorial due to COVID-19 or other circumstances beyond your control, please email your tutor explaining your situation. Your participation mark for that week will be the average of your other weeks' participation.
- In the event of widespread difficulties that prevent students from coming onto campus such as train strikes and floods, the course will provide alternative offerings for in-person tutorials as needed.

Assignment (15%)

- The marking criteria for the assignment will be outlined in the specification which will be released beginning of Week 2.
- Due Friday Week 4.
- Completed **individually**.

Project (35 %)

- The marking criteria for the project will be outlined in the specification which will be released at the beginning of Week 5.
- Groups of 4 formed within your tutorial.
- Groups formed by end of Week 2.
- Structure:
  - Milestone 1: Formative feedback (anytime)
  - Milestone 2: Submission of work (Week 8 Monday)
  - Milestone 3: Submission of work (Week 10 Monday)
  - Measures in place to ensure a difficult group doesn't take a toll on marks

Exam (35%)

- In 22T2 the COMP2511 exam will be held entirely online.
- 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 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 (Ed)
  - 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

Support

- 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 11
- VSCode
- Gradle 5.4.1 (Week 3 onwards)
- 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
- Feedback form
- Course account
- Student representatives

Respect

- Yourselves, each other, course staff

Let's have a fantastic T2!!!