

Lecturer: Dr. Shixun Huang

Applied Computing Research Lab  
University of Wollongong

2023 Spring Session

# Health and Safety Information for Students

Commencement of Session



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# What to do in an emergency?

## KEEP CALM – STAY SAFE

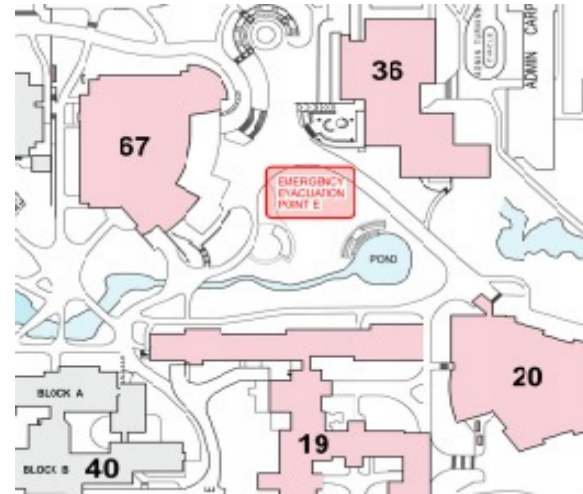
If the alarm sounds or you are notified to evacuate:

- Follow instructions of building warden or staff member
- Leave by the nearest safe emergency exit
- Proceed to your emergency evacuation assembly point
- Await further instructions
- Do not return to the building until it is safe to do so

If required to take shelter:

- Follow instructions of building warden or staff member
- Lock doors, close windows/blinds and seek refuge
- Await further instructions

The nearest assembly area for this building is:

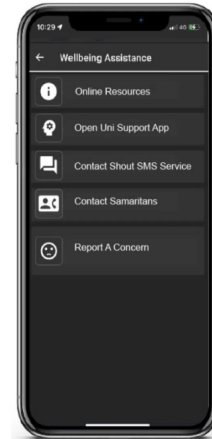
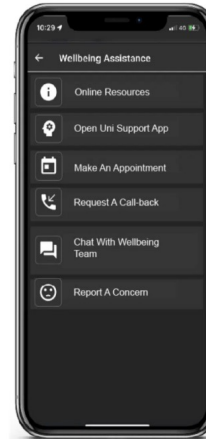
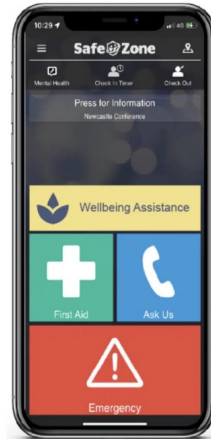


# Need assistance on campus?

**WE ARE HERE TO HELP**

If you require first aid or medical assistance while on campus:

- Locate a first aid officer, or
- Call UOW Security on 4221 4900, or
- Use Wellbeing Assistance, First Aid or Emergency buttons on SafeZone App available free for iOS, Android and Windows.



# Reporting hazards

**KEEPING YOUR UNIVERSITY SAFE AND COMFORTABLE**

If you notice any hazards (e.g. broken furniture or equipment) in your teaching area or anywhere on Campus:

- Report it to your Lecturer/Tutor/Supervisor
- The University has an online hazard and incident reporting tool called SafetyNet
- Report IT equipment hazards to Information Management and Technology Services on 4221 3000
- Report building and grounds hazards to Facilities Management Division on 4221 3217



# Smoke-Free University

**SAY GOODBYE TO SECONDHAND SMOKE**

All UOW public areas including buildings, eating areas, grounds, pathways and transport stops have been smoke-free since July 2016.

This includes the use of vapes and e-cigarettes.

Please co-operate with this policy to help make our campus healthier for everyone.

For more information:

[uow.info/smoke-free](http://uow.info/smoke-free)



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For more information: [uow.info/safe-at-work](https://uow.info/safe-at-work)



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# Acknowledgement of Country

- We acknowledge the Traditional Custodians of the lands on which the University of Wollongong is situated.
- We pay our respects to Aboriginal Elders past and present, who are the knowledge holders and teachers. We acknowledge their continued spiritual and cultural connection to Country.
- As we share knowledge, teaching, learning and research within this University we also pay respect to the knowledge embedded forever within the Aboriginal Custodianship of Country.



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# Workload

- This subject is worth 6 credit points.
  - 1 credit point is equivalent to 2 hours of work
- We have a 2-hour lecture (Wed), a 1-hour lecture/tutorial (Fri), a 2-hour laboratory (week 2 - 12).
- More details can be found from UOW timetable.



# Contact hours

Dr. Shixun Huang, Email: [shixunh@uow.edu.au](mailto:shixunh@uow.edu.au)

Monday 10:00 - 12:00 Room 103 at Building 3 (Webex available)

Thursday 15:00 - 17:00 Room 103 at Building 3 (Webex available)



# Lecture/tutorial

- To support lecture: go through some more examples
- To support lab: go over some lab exercises
- Discussions about assignments



# Textbook and references

- Lippman, Stanley B.; Lajoie, Josée; Moo, Barbara E.; C++ Primer (5th Edition), 2012.
- Scott Meyers, Effective modern C++, O'Reilly's, 2014.
- Arthur O'Dwyer, Mastering the C++17:STL, 2017.



# Other useful resources

- <http://www.icce.rug.nl/documents/cplusplus/>
- <http://www.cplusplus.com/>
- <https://stackoverflow.com/>
- <http://www.cppreference.com/>
- <http://en.cppreference.com/w/>
- <http://www.sgi.com/tech/stl/index.html>
- <https://www.bogotobogo.com/cplusplus/cpptut.php>



# Assessment

## **Three (3) assignments (30%):**

Assignment 1: 8%; Procedural Programming; due approx week 6

Assignment 2: 14%; Object Oriented Programming; due approx week 10

Assignment 3: 8%; Generic Programming; due approx week 13

## **Five (5) laboratories exercises (10%): Lab Attendance is encouraged.**

Each laboratory exercise is to be completed over two weeks and is worth 2%. The marking style is lenient. You must show commitment and get something to work. If your code does not compile because of syntax errors or memory leakage, you cannot expect to get full marks. Each lab exercise is an opportunity for you to practice C++ programming by solving simple problems.

## **Final examination (60%):**

Supervised online exam (closed book). **Every plagiarised answer will score a zero mark.**

## **Two TF requirements:**

At least 40% of the exam marks: 24/60. At least 60% of the laboratory marks: 6/10

**Not meeting one of these requirements, and obtaining 50 marks or more overall, *may* result in a TF grade.**

# Laboratory exercises

- They will range in difficulty, so some beginner exercises and some extension tasks
- Starter exercises to help you get ready for the next week's lab.

Lab submission time Friday 11:55pm of Session Week 3, 5, 7, 9, 11.

This is a **strict deadline**. Submissions after this point will not be accepted without academic consideration.

## **Marking criteria for each lab submission:**

Total points: 100 (equivalent to 2% of the overall mark for CSCI251)

There are 5 tasks. For each task:

- It has 20 points.
- Some subtasks have no points but you are encouraged to solve them because they might appear in the final exam.
- If the source code runs and the output is in line with the task requirement, you will get 20 points.
- (else) If not, we check your code. The marking style is lenient and depends on your efforts and commitment.



# Laboratory exercises

- CodeBlocks (desktop application)
  - Work at home
  - Easy to setup/install
- Ubuntu 18.04 ([capa.its.uow.edu.au](http://capa.its.uow.edu.au))
  - Ssh login
  - Compiler: GCC 7.5.0
  - Should be C++17 compliant
  - On Ubuntu/capa use g++
- Likely different standard compliant versions won't be 100% compatible.





# Some notes on assessment

- Any C++ programs submitted which do not produce the desired results are likely to receive deduction.
- Similarly, if your program doesn't compile.
- Students may query about the marking to the marker within two weeks of receiving the marks.
- If you require additional time to complete an assignment you must submit claims for extensions electronically via SOLS, *before the DUE date*.



# Some notes on assessment

- For assignments:
  - 25% penalty per day.
- For labs:
  - Strict 11:55pm Friday deadline for the relevant week.
- For marking Q&A:
  - Students -> Demonstrators -> Subject coordinator



# Academic misconduct

- The Academic Integrity Policy, available at:  
<http://www.uow.edu.au/about/policy/UOW058648.html>
- Plagiarism
  - Using another person's ideas, designs, words or any other work without appropriate acknowledgement ;
  - Re-using one's own work without appropriate acknowledgement.



# Academic misconduct

- copying without appropriate referencing
  - at the very least comment it, but if the code is mostly the work of others you are going to get zero.
- copying from each other
  - Github or sharing codes



# Subject Content Introduction



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# Subject Description

- C++ programming language
- three primary components
  - procedural programming
  - object-based/object-oriented programming
  - generic programming.
- Feature topics
  - memory management issues and dynamic memory allocation; classes; STL sequential and associative containers; operator overloading; advanced features in object-oriented programming; templates and exception handling; the latest C++ features (e.g. C++11 and C++14 standards).



# Subject Description

- beyond the object-based/object-oriented content of CSIT111 and CSIT121
- beyond the limitations of Java
- main focus: Procedural, object-based, object-oriented, and generic.
- comparison:
  - differences between Java and C++, for example the memory management models.
  - Different C++ version (C++11, 14, 17, ...)



# Subject Learning Outcomes

- On successful completion of this subject, students will be able to, to varying degrees:
  - Design and implement solutions to problems with the C++ programming language.
  - Design and implement procedural-based programming to solve problems.
  - Design and implement objects providing encapsulation, inheritance and polymorphism.
  - Design solutions to problems through the use of generic programming.
  - Design object-oriented solutions to problems.
  - Incorporate advanced features in C++ to achieve efficient implementations.





# Topics covered ... (roughly)

- C++ Foundations
  - Procedural Programming
  - Control structures
- Getting organised
  - Structures, unions, and randomness
  - Handling files
  - Exceptions (Part 1), namespaces, and defensive programming
- Programming with Class
  - Fundamental syntax and concepts
  - Constructors, Destructors
  - Class/object relations
- Generic Programming :
  - Function templates and compile time functionality
  - Class templating
  - The Standard Template Library (STL)



# Assignment coverage

## A1: Procedural programming:

- Design.
- Command line argument handling.
- File handling.
- Structs and early collections.
- Randomness.
- Control structures.
- Functions, passing by reference.
- Code organisation.
- Exceptions.



# Assignment coverage

## A2: Object Oriented programming :

- Design.
- Abstraction.
- Encapsulation.
- Inheritance.
- Other associations.
- Possibly polymorphism.
- Possibly overloading.
- More randomness.



# Assignment coverage

## A3: Generic programming :

- Class templates.
- Wrapping.
- Classes.
- Libraries.
- Possibly overloading.



# Practice makes better ...

- Learn from examples
- Practice variations and learn by making mistakes
- Exercises in the labs are there to help

