Advanced Object-Oriented Programming, Spring 2021

Course Information

Instructor

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  Office hour: Thursdays 17:00 to 19:00 & Fridays 17:00 to 19:00 (by appointment only).

Teaching Assistants

- 許俊瀚
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Prerequisites

- Students are assumed to have some exposure to programming languages and be familiar with basic data structures and computer organization.

Lectures

- Lectures will be held in EC-1006, on Thursdays from 2:10 p.m. to 5:00 p.m.

Textbooks

- Walter Savitch, *Absolute C++, Sixth Edition*, Addison Wesley (2016). **Required.** (開發)
- Bjarne Stroustrup, *The C++ Programming Language, Fourth Edition*, Addison-Wesley (2013). **Optional but highly recommended.**
- Nicolai M. Josuttis, *The C++ Standard Library: A Tutorial and Reference, Second Edition*, Addison-Wesley (2013). **Optional but highly recommended.**
- Brian W. Kernighan and Dennis M. Ritchie, *The C Programming Language, Second Edition*, Prentice Hall (1988). **Optional but highly recommended.**

References

- Bjarne Stroustrup, *The C++ Programming Language, Special Edition*, Addison-Wesley (2000). **Optional.**
- K. N. King, *C Programming: A Morden Approach, Second Edition*, Norton (2008). **Optional.** (開發)
- Yedidyah Langsam, Moshe J. Augenstein, and Aaron M. Tenenbaum, *Data Structures Using C and C++, Second Edition*, Prentice Hall (1996). **Optional.** (滄海)

- Ellis Horowitz, Sartaj Sahni, Dinesh P. Mehta, *Fundamentals of Data Structures in C++, Second Edition*, Silicon Press (2001). **Optional.** (開發)
- Mark Allen Weiss, *Data Structures and Problem Solving Using C++, Second Edition*, Addison-Wesley (2000). **Optional.** (開發)
- Richard M. Stallman, Roland McGrath, and Paul D. Smith, *GNU Make Manual, Version 4.1, September 2014.* (Available online at `http://www.gnu.org/software/make/manual/`)
- Richard Stallman, Roland Pesch, Stan Shebs, et al., *Debugging with gdb: The GNU Source-Level Debugger, Tenth Edition, for gdb version 7.5.* (Available online at `http://sourceware.org/gdb/download/onlinedocs/gdb.pdf.gz`)
- Norman Matloff and Peter Jay Salzman, *The Art of Debugging with GDB, DDD, and Eclipse, 1st Edition*, No Starch Press (2008).

More References

- Scott Meyers, *Effective Modern C++: 42 Specific Ways to Improve Your Use of C++11 and C++14*, O'Reilly (2015).
- David Goldberg, *What Every Computer Scientist Should Know About Floating-Point Arithmetic*, ACM Computing Surveys. 23(1):5–48 (March 1991).
- IEEE Computer Society, *IEEE Standard for Floating-Point Arithmetic: IEEE Std 754-2008 (Revision of IEEE Std 754-1985)*, IEEE (2008).

Grading

- Besides the homework assignments, there will be a midterm exam and a final exam. The homeworks will account for 50% of the grade, the midterm 20%, and the final 30%. In case of COVID-19 so that remote teaching is required, the homeworks will account for 70% of the grade, the midterm 10%, and the final 20%.
- Unless stated otherwise, you are required to work on all the homework assignments individually.
- No late homeworks will be accepted.
- No cheating.
- If you cheat on a homework assignment, midterm, or final, 2 times the points for that homework assignment or exam will be taken off your final grade for the first time, 4 times for the second time, 8 times for the third time, and so on. Also, you will receive no bonus points, if any.

Topics

1. C++ Basics
2. Flow of Control
3. Function Basics
4. Parameters and Overloading
5. Arrays
6. Structures and Classes
7. Constructors and Other Tools
8. Operator Overloading, Friends, and References
9. Strings
10. Pointers and Dynamic Arrays

11. Separate Compilation and Namespaces
12. Streams and File I/O
13. Recursion
14. Inheritance
15. Polymorphism and Virtual Functions
16. Templates
17. Linked Data Structures
18. Exception Handling
19. Standard Template Library
20. Patterns and UML