cs170su20-a.sg
High-Level Programming II: The C++ Programming Language
Summer, 2020

Prerequisites:

CS120

General Information:

Class Schedule: Wed, Fri 9.00am~10.40am, Thu 4.30~6.40pm (Lab)
Classroom: Online, MS Teams
Professor**:** Vadim SUROV
Contact**:** vsurov@digipen.edu
Class Web Page**:** https://distance.sg.digipen.edu/course/view.php?id=3956
Office Hours**:**

Description:

This course introduces the C++ language with particular emphasis on its object-oriented features. Topics include stylistic and usage differences between C and C++, namespaces, function and operator overloading, classes, inheritance, templates, and fundamental STL components.

Course Objectives and Learning Outcomes:

After successful completion of this course, the student must be able to read, write, and understand much of introductory C++. Specifically, students will be able to:

1. Understand differences between imperative programming as practiced in CS 120 and object oriented programming.
2. Understand concepts of data abstraction, inheritance, and polymorphism.
3. Understand concept of interface versus implementation.
4. Understand the challenges of building large-scale programs and how object-oriented programming facilitates it.
5. Understand the Standard C++ and Standard Template libraries and how to use them effectively in solving problems.
6. Apply course concepts to implement data structures and programs to solve various problems.
7. The successful student will be prepared for the next programming course in the sequence (CS 225: Advanced C/C++).
8. The successful student will be able to use the C++ language in the second year game courses.

Textbooks:

- C++ Primer, 5th Edition, Stanley B. Lippman, Josee Lajoie, Barbara E. Moo. Published by Addison-Wesley, ISBN-10: 0-321-71411-3

References:

- The C++ Programming Language, 3rd Edition, Bjarne Stroustrop. Published by AddisonWesley, ISBN-10: 0-201-32755-4.
- Programming: Principles and Practice Using C++, Bjarne Stroustrop. Published by AddisonWesley, ISBN-10: 0-321-54372-6.
- The C++ Standard Library: A Tutorial and Reference, 2 nd Edition, Nicolai M. Josuttis. Published by Addison-Wesley. ISBN-10: 0-321-62321-5.

Outline and Tentative Dates:

Please note that this is a tentative organization of the course and may be subject to change. Below is a list of topics that will be covered this semester. Depending on time, I may add additional topics or skip some of the ones listed.

Week	Topic	Milestone	Weight
1	Lab 1		
	Introduction		
	❏ Moving from C to C++	Quiz 0 (Test-run)	0
2	Lab 2	Lab 1 due	4
	❏ New C++ features		
	❏ Namespaces		
	❏ References	Quiz 1 (Differences And New Features)	1.67
3	Lab 3	Lab 2 due	4
	❏ Strings. Introduction To STL And Vectors		
	❏ Functions		
4	Lab 4	Lab 3 due	4
	❏ Classes And Objects		
		Quiz 2 (Namespaces, STL, Functions)	1.67
5	Lab 5	Lab 4 due	4
	No classes		
	❏ Member Initialization List		
	❏ Operator Overloading		
6		Lab 5 due	4
	❏ Operator Overloading As Methods		
	❏ Overload Resolution	Quiz 3 (Classes And Overloading)	1.67
7	Trimester Break. No classes		
8	Lab 6		
		Midterm Exam	20
	❏ Function Templates		
9	Lab 7	Lab 6 due	4
	❏ Class Templates		
	❏ Class Templates More Examples	Quiz 4 (Templates)	1.67

10	Lab 8 ❏ Exceptions	Lab 7 due	4
11	Lab 9 ❏ Inheritance	Lab 8 due Quiz 5 (Exceptions)	4 1.67
12	Lab 10 ❏ Polymorphism	Lab 9 due	4
13	Lab11 (Review) ❏ File I/O ❏ Type Casting And Identification	Lab 10 due Quiz 6 (Inheritance And Polymorphism)	4 1.67
14		Final Exam	30
		Total	**100**

Grading Policy:

Grades will be derived from homeworks, exams and quizzes. The detailed weightings are as such:

Labs	40% (10 labs with programming assignments)
Midterm Exam	20%
Final Exam	30%
Quizzes	10%
Attendance	-1% for each absence

Important: In addition to the minimum requirement of the final grade, you must receive an average score of 60% on both the midterm and final exams combined to pass this course, regardless of your assignment/quiz/class activity scores.

Final letter grade algorithm:

Grade	%
A	93 – 100
A-	90 – 92.99
B+	87 – 89.99
B	83 – 86.99
B-	80 – 82.99
C+	77 – 79.99
C	73 – 76.99
C-	70 – 72.99
D	60 – 69.99
F	< 60

Assessment:

Programming assignments will (obviously) use the C++ programming language. More specifically, all programs must adhere to Standard C++, which is what this course is all about. Every assignment will consist of a program specification that lists the C++ classes and

functions you must implement to complete the assignment. You must strive to follow all of the directions exactly as specified in the specification.

Your assignment submission will be evaluated and graded based on the following assessment criteria:

- Submissions after the due time and/or date have elapsed will receive a zero grade. Medical leave and family emergencies – both accompanied by appropriate documents will be the only exceptions to this policy.
- Submissions that do not compile or crash will receive a zero grade. There will be no exceptions to this policy.
- Submissions that do not compile cleanly will receive a penalty of 10 points for each compiler warning. This means that your assignment grade will be penalized 50 points if your program compiles with 5 warning messages.
- Submissions that generate different output data compared to the correct output data supplied with the assignment will be penalized for each such instance.
- Submissions that do not follow the Code Quality Guidelines and Coding Style Guide specified in the course web page will be penalized 10 points for every violation. This means that your assignment grade will be penalized 50 points if your source code contains 5 violations.
- Each instance of a memory leak in your program will receive a penalty of 50 points.
- Finally, you will not be given credit for the assignment if you do not enclose an affirmation about sole ownership and non-plagiarism in the implementation and completion of the assignment.

Submitting Assignments:

All assignments are designed using MyTAonline.com service. You will have an online page provided to read specs, compile code, execute and submit your code.

Just in case, when submitting source files written in C++, you must adhere to the following guidelines: All files must be in a single ZIP archive (even if you are submitting a single file). The name of the ZIP file must follow this naming convention:

<class_name>_<login>_<assignment number>.zip

For example, if a student with login name foo.bar submits assignment #3 for CS170, the appropriate filename would be **cs170_foo.bar_3.zip** (all lowercase letters). Note that the .zip file names are case sensitive and must be in lowercase, exactly as described above. Additional detailed instructions will be provided with each assignment specification.

Every assignment submitted in MyTAonline or on the course web page will contain a date/time stamp. Assignments that are submitted after the deadline will be graded but will be given a zero grade. There is more than enough time in your schedule to complete assignments on time. Of course, if you wait until the due date/time is near to begin your assignment; you may not complete it on time. Time management is your responsibility

Last Day to Withdraw:

In order to withdraw from a course, it is not sufficient simply to stop attending class or to inform the instructor. In accordance with the policy, contact your advisor or the Registrar to begin the withdrawal process.

The last day for withdrawal from this course is **July 15.**

Academic Integrity Policy:

Quizzes, exams and assignments are NOT group projects. They must represent a student's own individual work. It is reasonable for students to consult or discuss general solutions to an assignment. However, it is unreasonable for students to collaborate on detailed solutions, to copy code, or to give away code. Please keep in mind that discussing solutions to exams, quizzes, homework, etc. with students that have not yet taken the exam or have not yet submitted the homework is also prohibited.

Cheating, or academic dishonesty in any form will not be tolerated in this course. Cheating, copying, plagiarizing, or any other form of academic dishonesty (including doing someone else's individual assignments) will result in, at the extreme minimum, a zero on the assignment in question, and could result in a failing grade in the course or even expulsion from DigiPen.

Academic dishonesty or cheating occurs when a student represents someone else's work as his/her own, or assists another student in doing so. This can happen on exams, quizzes, homework, or projects. Academic dishonesty may also occur when a student uses any prohibited reference or equipment in the completion of a task. Examples include using a calculator, or notes, or books, or the internet when such sources are prohibited for that task. Plagiarism is a common form of academic dishonesty. This takes the form of copying and pasting excerpts from the web and representing them as original work. The type and severity of any occurrence, as well as the legitimacy of any claim of academic dishonesty will be judged by the instructor and the disciplinary committee. All students are asked to help in promoting a culture of academic integrity by discouraging cheating in all forms.

Ultimately, you are only wasting your time (and money) because if you cannot master the fundamentals covered in this course, you have little hope of succeeding in other courses or as a programmer in the Real World. Please consult your student handbook for additional information and details on DigiPen Singapore's academic integrity policy.

External Preparation:

It is expected that the students in this class spend 8 hours on average per week for outside classroom activities through the trimester, including, but not limited to, homework, reading assignments, project implementation, group discussions, preparation of examinations, etc.

Disability Support Services:

Students who have special needs or medical conditions and require formal accommodations in order to fully participate or effectively demonstrate learning in this class should contact the Student Life & Advising Office (studentlife.sg@digipen.edu) at the beginning of each semester. A Student Life & Advising Officer will meet with the student privately to discuss how the accommodations will be implemented.

Additional sections

E-learning

All classes and labs are conducted online using MS Teams and MyTAonlie services. Information such as page address, session id, password will be available on the course web page 10 minutes before class or lab started. Your attendance must be checked during the online session on the same web page in the Moodle.

Software and hardware requirements

Compiler version: GCC 9.1.0. See the course web page how to install compiler, compile code and execute program on your computer. If you cannot compile on your computer, you can find helpful online services like jdoodle.com and ideone.com.

Stable internet access from your place. Computer with web browser (Chrome browser is preferable because MyTAonline is tested on Chrome, but other browsers also can be used), web camera and microphone.

If you have any problem with MyTAonline, report to admin@mytaonline.com or instructor.

When a problem is technical, related to access to the Moodle or MS Teams, please raise such issues to our IT department.