Instructor: Long Nguyen

Course Mode: This offering is a mixed between online and scheduled sections.   The course fundamentally will be conducted as if it were an online course with lecture recordings provided each week which each student is responsible for viewing. In addition, there will be an optional live lecture given each week on that week's topic (exact same content as lecture recordings); these are not mandatory, however students are encouraged to attend if they are able as they provide an opportunity for students to ask questions as they arise. Students may choose which mode they wish to participate in week by week.

Live lectures will be held on Tuesdays, 6:45-9:50PM via Zoom, links found on Canvas.

Finals: Take home with option sit in session.

Office Hours: TBA in course shell.

Contact: For all course related questions or concerns the preferred mode of inquiry will be the use of the course Canvas Shell Discussion Forum.

For personal matters you may contact me using Canvas Direct Messaging or email me directly at: nguyen_long@smc.edu. Note: any attachments found in direct emails will cause those emails to be quarantined, if for any reason you need to attach a file to a message use Canvas Direct Messaging which will house the file on SMC Canvas servers prior to forwarding them to me. Alternatively, you can also host your files via your own cloud storage and provide a link in your emails.

Submitted work over canvas allows students to add comments to each submission. I will not see any comments placed in this way. If you wish to convey information to me, please use any of the other methods above.

Rec Prereq: SMC CS 52 or equivalent C++ course

Course Description:
This course is an introduction into the study of computer algorithms and data structures. This advanced programming course will use the C++ language to teach methods of representing and manipulating data within a computer. Topics include stacks, queues, trees, sorting, searching, modeling, and dynamically created storage spaces. Students will learn the problem-solving skills necessary to write and read complex computer programs, and to make important design decisions.

Student Learning Outcomes:
1. Understand the impact and influence that various design decisions have in the run-time cost of different computer programs.
2. Use and apply the different data structures presented in class by practicing the software techniques associated with large programming projects.

Class Text:
There is **no official text** for this course. Relevant readings and materials will be made available throughout the course. If it turns out that every student has access to any particular text, I may refer to them more directly. Useful texts:

- Problem Solving with C++, by Walter Savitch. Anything past 6th Edition will be relevant, however 8th Edition and above will be updated with C++11 standard which we'll be referenced

throughout the course, however this is a minor point and what I mention in lecture on the features of the standard should be sufficient.

- Thinking in C++ 2nd Edition by Bruce Eckel, is **freely** available and will also be available on the course website. Not the best book for beginners or those who aren't a little comfortable with the basic features of C++. But many may still find it a useful reference.
- Data Abstraction and Problem Solving with C++: Walls and Mirrors. 7th Edition, by Frank M. Carrano. 6th Edition is largely the same text, but is not updated for C++11 standard,

Class website:

The course will be using Canvas to facilitate the activities, submission of assignments when applicable, and housing materials. Students are **expected to check the class website regularly**. Your username is your SMC email address without the @smc.edu portion. Your password is the same one your use for Corsair Connect. All course and lecture content has been made available thru this course website.

Software:

The course will be using Microsoft Visual Studio C++ 2019. Everyone will have access to the IDE through SMC Virtual Lab through Remote Desktop. You may work in any C++11 compliant compiler on your own. However, you will have to at least test once in Visual Studio C++ 2019 prior to submission. A license for Visual Studio C++ 2019 is freely available for all SMC students through MS Azure, if you would like to use the environment on your own devices.

Evaluation and Grading:

Participation: This largely consists of discussions either during the live lecture or on the Canvas Discussion Forum. In addition, each lecture will be accompanied by a companion forum post where each student is expected to interact with by submitting at least two independent posts regarding that week's lecture. For example, two separate questions, or two answers to other students questions, expanding or discussing another student's question or answer, or any combination of.

Projects: During the semester, a number of programming projects will need to be completed. There are 5 programming projects planned, although this may be more or less depending on the pace of the class. These Programming Projects need to be turned in on the date scheduled. **All projects must minimally compile in Microsoft Visual Studio C++ 2017 or newer**, any code submitted that does not compile will receive a zero score.

Quizzes: There will be weekly quizzes covering textbook reading assignments and class activities. Each quiz will only cover a small section of that week's class content.

Midterm: A midterm will be given midway in the semester after we cover the advanced features of C++. You must take the midterm. Anyone who does not complete the midterm will be dropped from the course.

Final Exam: A comprehensive final exam will be given at the end of the semester. It will cover most topics covered during the course, with emphasis on topics covered later in the course.

Note: If an emergency arises which prevents you from taking the quiz or exam let me know as soon as possible.

         If I have reasonable submissions for all projects and all quizzes, I will drop the lowest score in that category.

Assessment:

Category	Percent
Participation	15%
Projects	25%
Quizzes	15%
Midterm	22%
Final	23%

Scale:

Grade	Percent
A	90%
B	80%
C	70%
D	60%
F	50%

Tentative Class Schedule

Below is a <u>tentative</u> schedule and is subject to change as the course progresses. Check the course website for the updated schedule.

Lectures and reading assignment will cover the materials from texts and handouts. It is important to attend class and check the class website since changes may be made to the schedule published below.

Week	Topics
1	Introduction, ADT
2	Structs/ Classes, C'tor/D'tor, Separate Compilation
3	Pointers, Dynamic Memory
4	Dynamic Memory, Copy C'tor, Assignment Op
5	Class Composition, Inheritance
6	Polymorphism
7	Polymorphism continued, Templates
8	**Midterm: In Class 6:45-9:50PM Mark your calendars!**
9	Spring Break
10	Linked Lists, Stacks, Queues
11	Recursion
12	Big-O, Sorting
13	Binary Search Trees
14	Hash Tables
15	Heaps
16	Graphs
17	**Finals**

Submissions:

All your work will either be completed in Canvas or uploaded to canvas. Specific details will be provided for each deliverable on its canvas page. Of particular note for uploads, make sure you re-download your submissions to make sure you have uploaded the required files and to check if the upload was corrupted in any way. If the submission includes source code, make sure the source code compiles. Issues regarding incorrect submissions happens more than you think.

Late Policy

Documented excuses will managed on a case by case basis to determine what, if any, accommodations for late work is appropriate. Aside from that, for projects, anything submitted within 24 hours after the due date will be penalized by 10%. Then after that point up 5 days after the due date will be penalized by 30%, no submissions will be accepted after that point. If an extension is provided for a project that lies outside the late penalty window of 5 days past due date, the extended date becomes a hard cut off point after which no submission is accepted. Quizzes and exams are given a window of time to be completed and must be completed in that window.

Honor Code and Code of Student Conduct

As a testament to their commitment and readiness to join the Santa Monica College academic community, all students are expected to uphold the Honor Code. At the time of admission, students will certify the following statement:

> *In the pursuit of the high ideals and rigorous standards of academic life, I commit myself to respect and uphold the Santa Monica College Honor Code, Code of Academic Conduct, and Student Conduct Code. I will conduct myself honorably as a responsible member of the SMC community in all endeavors I pursue.*

Honest and ethical students are protected in this class. The SMC Honor Code and Code of Academic Integrity, printed in the General Catalog, remind students of their responsibility to behave honestly and ethically. It is your responsibility to familiarize yourself with these codes. Please be extremely careful that you do not engage in any behavior that could even be construed as cheating. Outside of class, students are allowed to study together. However, copying another student's homework is not acceptable.   If I determine that students have relied too heavily on each other in preparing homework or any other project, the students may be assigned no credit. Future occurrences could result in academic disciplinary action.

Cheating

All work you submit must be your own individual work. If you copy another person's work or let another person copy your work, you are cheating. Cases where submitted work looks alike will result in an "F" on the project and will be subject to the student discipline process. The College's Code of Academic Conduct applies to each and every course as well as each and every member of the academic community, faculty and students alike.

Discrimination

Santa Monica College and this academic department welcome students from all over the world with various backgrounds and life experiences. SMC is committed to fostering a safe and productive learning environment. SMC has zero tolerance for discrimination, and/or sexual harassment, which includes sexual misconduct such as, domestic and dating violence, sexual assault, sexual exploitation, and stalking. Any sexual violence or physical abuse, as defined by California law, whether committed by an employee, student, or member of the public, occurring on college-owned or controlled property, at college-sponsored or supervised functions, or related to or arising from college attendance or activity is a violation of District policies and regulations, and is subject to all applicable punishment, including criminal and/or civil prosecution and employee or student discipline procedures.

SMC Students assume an obligation to conduct themselves in a manner compatible with the college's function as an educational institution, which respects the rights of others to learn, and to acknowledge

the academic freedom to teach and communicate in an environment that fosters learning and creativity. With that in mind, it is important to keep a respectful tone and attitude when communicating and interacting with your colleagues. You are the only you. No one else will have your sensibilities of what is funny or interesting. Part of being respectful is also realizing that someone else may be offended by something you think is "every day normal."

Students who have experienced some form of sexual misconduct or discrimination are encouraged to talk to someone about their experience, so they can get the support they need. To learn more about support available for students, please see http://www.smc.edu/StudentServices/SVRP/Pages/Learn-About-Title-IX.aspx.

Students with Special Needs

In compliance with the Americans with Disabilities Act (ADA), all qualified students enrolled in this course are entitled to "reasonable accommodations". Any student who needs special attention should speak privately with the instructor to describe their needs. This should be done within the first two weeks of the start of class. The Center for Students with Disabilities is located in Room 101 of the Admission/Student Services Complex, next to Admissions. For more information, call (310) 434-4265

Incomplete Policy

Students will not be given an incomplete grade in the course without sound reason and documented evidence. In any case, for a student to receive an incomplete, he or she must be passing and have completed a significant portion of the course. Make sure you are aware of the college drop policy. In case of absence, it is your responsibility to find out what material was covered and what assignments were given.

IT IS YOUR RESPONSIBILITY TO DROP/WITHDRAW FROM CLASS BY THE PUBLISHED DEADLINES OR YOU WILL RECEIVE A GRADE.