# MQF 633: C++ for Financial Engineering

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## 19 years working experience, worked in manufacturing, software, banks and fin-tech, as an engineer, consultant, developer, quant etc. Now as head of quant in Maybank.

## Lecturer Background

## Learning journey of programming. From Matlab, R to VBA, then C/C++, Java, C#. A late self-learner for C++. Only start to learn C++ around 2012. Now, I am quite comfortable to work in any software development domain with C++, Python, Java, C# etc

## For C++, it is a tough learning journey: from text book, training courses, to on the job try and error, and lately from all sorts on-line resources. I am still learning on new and interesting topics.

* **Till today, in many area C++ is still a very commonly used and yet challenging language. C++ itsself also adapting almost every year to modern topics. But one can truly master it as long as one get it start, with proper tools, and keep learning/improving**

## 10 lectures, assignments and 2 projects

## Course Structure

Basics of C++ (part 1)

* Lecture 1: Introduction of C++
* Lecture 2: Data types and basic syntax
* Lecture 3: Functions and Modular Programming
* Lecture 4: Object-Oriented Programming (OOP)
* Lecture 5: More OOP examples and smart pointers

First half Project

Advanced topics (part2)

* Lecture 6: Standard Template Library Examples
* Lecture 7: Template and design patterns
* Lecture 8: Concurrency, multi-threading and parallelism
* Lecture 9: From C/C++ to Python
* Lecture 10: Final project of C++ on Financial Engineering topics

Final project

**Prerequisite**

* Study group: one group of 2-3 students
* Install VS Code (mac) or Visual Studio, choose either use windows or iOS

### Goal of the course

* Level 1: Be able to understand most of C++ syntax and debug C++ program
* Level 2: Be able to understand and write a simple OOP C++ program
* Level 3, understand the usage of smart pointer, references and const etc
* Level 4: understand basic principle of mult-threading, concurrency and thread safety
* Level 5: understand the commonly used design pattern

### Marking

Good news is no exam, and need a lot of hands on

* Attendance (20%)
* Assignments (30%)
* Project 1 (20%)
* Project 2 (30%)