



MSFE

## Preparatory Computer Programming (C++) Course Summer 2017

Monday, August 14 – Friday, August 18, 2017  
9:00AM-12:20PM; Siebel Room 1105

Instructor: Prof. R.S. Sreenivas  
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Cost: \$950 (Prepay via QuikPAY)

**Course Description:** This short course is meant to bring everyone up-to-speed on computing preliminaries that are required for IE523: *Financial Computing*. This bootcamp will be conducted for half-day-each-day from August 14th to August 18th. If you are confident of the C++ skills listed below, you do not have to attend the bootcamp. Everyone else must seriously consider attending the bootcamp. The time spent reviewing this material during regular class-hours can be better spend doing financial computing case studies.

**Primary Text:** Lessons/Videos with Code Samples written by me.

### Course Overview

**Day 1: Getting Started:** XCode (Mac) and Visual Studio (Windows)  
(see section 2 below for details)

**Day 1: Basics of C++:** Global and Local Variables, Typecasting, Scope.

**Day 1: Pointers, References, etc:** Passing-by-value, passing-by-reference, passing-by-pointers.

**Day 1: Dynamic Arrays:** Memory allocation in C++; Creating dynamic arrays using pointers-to-pointers, etc.

**Day 2: Objects and Classes:** Textbook cases; Private-, Public-, member-functions, constructor, destructor, overloading, inheritance, etc.

**Day 2: Input/Output:** Reading/writing data; fstream, ifstream, of-stream objects; Case-Studies.

**Day 2: C++ Standard Template Library (STL) Classes:** vector, arrays, queues, deque, lists unordered\_maps, unordered\_sets, maps, sets, etc.

**Day 3: Something specific to IE523:** Running code via the command-line; Illustrative Examples (that show why we require it for IE523!).

**Day 4: Something specific to IE523:** 2/D/3D plots using MAT-LAB/SUMULINK; Random Number Generation using the C++ STL

**Day 5: Toolkits:** Installing the Ip\_solve Mixed-Integer Linear Programming (MILP) solver; Installing the NEWMAT matrix-library; Linear Algebra in C++ (with NEWMAT) Case-Studies.

### **General Instructions**

We will support only two computing platforms for this short course (and IE523: Financial Computing in the Fall). If you have a Mac or a Windows machine, you are OK. All other platforms will not be supported.

Mac users can download the latest version of Xcode (a state-of-art C/C++ compiler) from the App Store for free. You can install Xcode before you come to this bootcamp (or, IE523: Financial Computing in the Fall).

Windows users can install the latest version of Visual Studio (after you get a legal user-id from UIUC). This is done through the Webstore at <http://webstore.illinois.edu/home/>

It will ask you for your bluestem-login (which you will get after you are officially enrolled). Try getting this done before the first day of class.

For what is worth, you can also install MATLAB/SIMULINK for free using the Webstore. To use MATLAB/SIMULINK you will need to be on a VPN-connection to UIUC. Click this [link](#) for details on VPN-connections at the UIUC.