

C++ Class Outline

Fall 2005

Useful Books:

- *C++ Primer Plus* by Stephen Prata

A good book to learn from.

- *Numerical Recipes in C*

Available online at: <http://www.library.cornell.edu/nr/bookcpdf.html>

Additional Books:

- Bjarne Stroustrup's *The C++ Programming Language*

The classic book on C++ written by the creator but difficult for beginner's to learn from.

Class Outline:

1. Getting Started

- **Topics:** background, creating programs, a simple program, libraries, commenting, I/O, data types, arithmetic operators
- **Reference:** Chapters 1,2 and 3 of *C++ Primer Plus*
- **Task:** Create, compile, and execute a simple program using *Microsoft Visual C++*.

2. Loops and Conditionals

- **Topics:** loops, conditionals, logical operators
- **Reference:** Chapters 5 and 6 of *C++ Primer Plus*

3. Input, Output, and Files

- **Topics:** `iostream`, `cin`, `cout`, formatting output, reading and writing to files
- **Reference:** Chapter 17 of *C++ Primer Plus*

4. Functions

- **Topics:** functions, header files, storage classes, scope, references, value versus reference
- **Reference:** Chapter 7 of *C++ Primer Plus*

5. Arrays and Pointers

- **Topics:** arrays, multidimensional arrays, pointers, using pointers with functions, relationship between pointers and arrays, dynamic memory allocation, pointers to functions
- **Reference:** Chapter 4 and 7 of *C++ Primer Plus*

6. Random Number Generators

- **Topics:** pseudorandom versus random, seeding
- **Reference:** Chapter 7 of *Numerical Recipes in C* and Chapter 11 of *C++ Primer Plus*

7. Structures, Classes, and Objects

- **Topics:** structures, classes: public versus private, constructors, destructors, class definitions, member functions, objects
- **Reference:** Chapters 4 and 10 of *C++ Primer Plus*

8. Calling C from Matlab

- **Topics:** Creating C language MEX-files, compiling mex files, mexfunction, mxArray
- **Reference:** <http://www.mathworks.com/access/helpdesk/help/techdoc/matlab.html>

9. Calling Matlab from C

- **Topics:** matlab engine, compiling
- **Reference:** <http://www.mathworks.com/access/helpdesk/help/techdoc/matlab.html>