Location

Lecture:

ES&T L1125, 1005 - 1055

Recitation:

Section A, GR, Molecular Sciences & Engr 1222, 1605 - 1725

Instructor

Bob Waters

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Room 120

Office Hours: 0900-1200 Tuesday, or Open Door policy.

Teaching Assistants

John Girata
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Course Learning Objectives

(Accomplishment) Complete a large programming project in a non-garbage collected complex language.

(Competency) Understand memory allocation strategies and resource management. This includes the use of smart pointers and the RAII pattern.

(Competency) Understand safety and correctness considerations in the face of exceptions.

(Competency) Understand operator overloading and good class design, including copy constructors, explicit constructors and conversions.

(Competency) Understand the basic concepts of templating and generic programming. Write template classes and functions/methods.

(Competency) Understand the basic structure of the Standard Template Library (STL). Be able to use basic data structures, iterators and algorithms in the STL in a program.

(Competency) Understand good C++ coding style such as proper use of const, references vs. pointers, the four types of casts(static, dynamic, const and reinterpret), virtual and non virtual methods, etc.

(Competency) Understand streams and the basic C++ IO paradigm.

(Competency) Understand proper use of new C++11 constructs like lambda expressions, ranged for, enum class, and additions to the standard library.

Readings and Recommended Texts

Recommended Books:

Effective C++, Scott Myers, 3d Edition

C++ Standard Library and Tutorial, 2d Edition

Electronic Books:

Thinking in C++, Bruce Eckel http://www.mindview.net/Books/TICPP/ThinkingInCPP2e.html

Available on-line here:

http://www.linuxtopia.org/online_books/programming_books/thinking_in_c++/index.html

C++ Stroustrop
http://proquest.safaribooksonline.com.prx.library.gatech.edu/book/programming/cplusplus/0201700735

C++ Primer
http://proquest.safaribooksonline.com.prx.library.gatech.edu/book/programming/cplusplus/0201721481

On-Line API documentation:
http://cplusplus.com/

C++ 11 Standard:
The standard is in the resources section.

Great Review and Testing Site
Sutter's Mill

Grading

Grade Percents are as follows:

Coding Assignments 30%

Course Project 40%

Recitation Quizzes and Labs 25%

In-Class Quizzes 5%

Schedule

Date	Topic	Reading	Assignment
01/07	Course Introduction, C++ Intro		
01/09	C++ Intro, C Review		
01/11	C Review, C++ for C programmers		
	RECITATION	None First Week	
01/14	C++ for C programmers		
01/16	Class Definition and OO		
01/18	Class Definition and OO, Iheritance, polymorphism, virtual functions		
	RECITATION	Getting set up with latest GCC Writing and Compiling A Basic Program. Code Assignment 1 released	
01/21	SCHOOL HOLIDAY		
01/23	OO Polymorphism,		

	Diamond Problem, LSP, virtual inheritence and the diamond problem, passing polymorphic references. The slicing problem.		
01/25	Operator Overloading		
	RECITATION	Value Passing and Basic Containers	
01/28	Exceptions		
01/30			
02/01	Stream Classes and IO		
	RECITATION	Understanding Construction and Destruction of Objects	
02/04	String Stream, Mutable		
02/06	Memory allocation, RAII, Smart Pointers		
02/08	Smart Pointers		
	RECITATION		
02/11	Move Semantics		
02/13	Template Classes STL Containers and Iterators		
02/15	STL Containers		
	RECITATION	Homework Help	
02/18	STL ALgorithms		
02/20	STL Algorithms and Functors		
02/22			
	RECITATION	Smart Pointers and Exceptions	
02/25	lambda expressions		
02/27	Regex and String Libraries		
03/01			
	RECITATION	constexpr and decltype	
03/04			
03/06			
03/08	Java Integration and JNI		
	RECITATION	FALL BREAK	
03/11	STL Functors		

03/13	Poker Exercise		
03/15	Poker Exercise		
	RECITATION	Recitation - STL issues	
03/18	Spring Break		
03/20	Spring Break		
03/22	Spring Break		
	RECITATION	Homework Help	
03/25	Utilities Random and Chrono		
03/27	Doxygen and documentation, constexpr, decltype, bitset		
03/29	Boost libraries: serialization		
	RECITATION		
04/01	Boost Testing Framework, Boost libraries: graph		
04/03	Boost Libraries: statechart, Building Dynamic and Static Libraries		
04/05	C++ Q&A		
	RECITATION		
04/08	Boost asio networking and ACE		
04/10	Standard Threading Library (C++ 11)		
04/12	Standard Threading Library (C++ 11)		
	RECITATION		
04/15	GUI development with Wxwidget C++ Puzzles		
04/17	Project Demos		
04/19	Project Demos		
	RECITATION	Project Demos	
04/22	Final Project Demo	DEAD WEEK	
04/24	Final Project Demo	DEAD WEEK	
04/26	Final Project Demo	DEAD WEEK	
	RECITATION	Project Demos during recitation periods	
04/29 - 05/03	FINALS WEEK	No Final in this class, programming project course	