Informal description

Design cannot be understood in the abstract: To discuss design you need concrete examples – preferably examples of both good and bad design. Conversely, you cannot understand a programming language or use it well by just learning the rules for its individual features – you need to understand the general design ideas behind the language: Its “philosophy.” The next generation C++, C++0x, and its standard library will provide concrete examples for the discussion of design. Many of the C++0x language features and library components are available for practical experiments. This course is topical because the new C++ standard is scheduled to be complete in March 2011 and initial implementations of new features and standard library components are available for experimentation.

This course will involve a fair bit of reading, some programming, and some writing. Specific topics will include initialization mechanisms, generic programming support (e.g. templates, variadic templates, and lambdas), concurrency support (threads, language guarantees, and futures), and a few libraries (e.g. regular expressions and containers). If you aspire to become an expert programmer or to gain insights into practical programming language and library design, this may be a good course for you.

Course Description and Prerequisites

This course explores the interactions among language design, library design, and program design in the context of ISO standard C++. Novel features provided by C++0x and the design and programming techniques they support are featured.

Requirements: Graduate standing or Sr. undergrad with Instructor's permission. A basic understanding of C++ and experience with a software development project (in any language) would be an advantage.

Learning Outcomes or Course Objectives

After the course, the student will have a good knowledge of C++ (including C++0x), an ability to evaluate language, library, and program designs. The student will also have some experience in putting this understanding into practical use as part of a design and programming project.

Textbook and/or Resource Material

The ISO C++ standard, The C++0x FAQ, papers on C++ (incl. the ACM History of Programming Languages papers on C++), draft chapters of The C++ Programming Language (4th Edition).

Time and place

TR 9:35-10:50 in Richardson 912B.