

CS98SI Course Information

Title: Modern C++ Techniques
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Time: M 3:15-4:30
Location: Gates 498

Description: CS98SI seeks to introduce some of the most recent (since the ISO standardization in 1998) developments in C++ design, particularly in library design. In particular, we will cover policy-based class design and implementation, full and partial template specialization, domain-specific embedded languages, expression templates, type-selection, other devices used in template metaprogramming, and perhaps (time-permitting) other techniques.

Prerequisites: This class assumes a knowledge of C++ amounting to more or less what was taught in CS107, especially if you took the 107L portion (That is, CS107 is pretty necessary; CS107L would be helpful.)

Particular concepts: basic template understanding; the STL; private, public, and protected inheritance; operator overloading (would be nice); a reasonable understanding of run-time polymorphism (virtual functions and such); and an understanding of the compile/link cycle in C++, though I'll be talking about that a bit.

That said, I will be more than glad to go over any of these concepts with you or point you to resources where you can learn these on your own (relatively quickly).

Sources/Reading: No books are required for this class. I'll make handouts like this one and give them to you.

The concepts are pulled from a number of sources, all of which I recommend. The most notable ones are:

1. Alexandrescu, *Modern C++ Design*
2. Abrahams and Gurtovoy, *C++ Template Metaprogramming*.
3. All over Boost.org.
4. Gamma, et al. *Design Patterns*
5. Sutter, *Exceptional C++; More Exceptional C++*
6. Vandervoode and Josuttis, *C++ Templates*

Assignments: No midterm, no final, no paper. Yay. There will be two assignments One will focus on a policy based class. The other is a library you get to design, and at least partially implement it. (That is, work out the interface issues, then work out the implementation issues enough that finishing it is straightforward.)