1. **Number and title of course:** CS 164, Programming Languages and Compilers

2. **Course objectives:** Understanding of programming language design and implementation. Practical experience in the construction of language processors (interpreters, compilers).

3. **Topics covered:**
   - Lexical Analysis
   - Finite Automata
   - Parsing
   - Ambiguity and errors
   - Top-down parsing
   - Bottom-up parsing
   - LR Parsing
   - Semantic Analysis
   - Type Checking
   - Cool type checking
   - Runtime organization
   - Simple code generation
   - Object oriented code generation
   - Local optimization
   - Global optimization
   - Garbage collection
   - Higher-order type systems
   - Parametric Polymorphism
   - Language-based security

4. **Relationship of course to program objectives:** This course requires students to apply their fundamental knowledge of math, science, and engineering to analyze and solve engineering problems. They learn to apply modern skills, techniques, and engineering tools to meet desired needs. Students learn to communicate their ideas and work in collaboration with members of an engineering team. They learn to identify, formulate, and solve challenging engineering problems.

5. **Prepared by:** George Necula (3/24/06)