SPRING 2008 SYLLABUS

CS 603 Organization of Programming Languages (3-0) Three hours.
Design and implementation of programming languages; syntax and translation; semantic structures and run-time representations; data, operations, control structures, and storage management.
Course prerequisite: CS 403 or 503 or equivalent

Language prereq: Previous experience with languages in the C/C**++**/Java family, and the ability to quickly learn new unfamiliar languages such as Scheme, ML, Smalltalk, and Prolog.

Mathematics prereq: Recursive functions, logic, sets, proofs, formal notations.

Instructor: Dr. Richard Borie, borie@cs.ua.edu, Houser Hall room 116
Office hours: MWF 12–1, and MW 2–3:30

Course schedule: A tentative schedule of lecture topics, exam dates, assignment due dates, and recommended readings will be maintained on the course web page (http://cs.ua.edu/603).

Textbook: Programming Languages: An Interpreter-Based Approach, by Norman Ramsey and Samuel Kamin [Obtain the Spring 2008 edition at the Supply Store in Ferguson Center.]

Topics:
- Introduction, grammars, design of a simple interpreter (Chapters 1, 2)
- Scheme, ML, implementation of functional programming (Chapters 3, 5)
- Smalltalk, implementation of object-oriented programming (Chapter 9)
- Logic, Prolog, implementation of logic programming (Chapter 10)
- Semantics

Goals/Objectives:
- Understand and explain the details of several language paradigms (imperative, functional, object-oriented, and logic programming).
- Read and write programs in general-purpose languages using concepts from each paradigm.
- Examine and modify interpreters that implement each language paradigm.
- Understand, write, and modify formal syntax and formal semantics definitions for a language.
- Use, evaluate, choose, and design programming languages for particular tasks.

Assignments and grade computation:
- Programming projects and other out-of-class work $\rightarrow$ 20 %
- Three closed-book midterm exams $\rightarrow$ 50 %
- A closed-book final exam $\rightarrow$ 30 %
  - To prepare for each exam: Do all the assignments. Solve extra problems at the end of each chapter and/or in the lecture notes. Practice by working exams from previous years.

Policies
- If you miss any exam, you must provide a valid excuse to receive a make-up exam; otherwise a 0 will be recorded. Valid excuses include university-sponsored trips and medical emergencies.
- Daily attendance is expected but not mandatory. However, students who regularly attend class will typically achieve higher grades than those who do not.