

## SPRING 2007 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.

**Prerequisite:** CS 403 or unconditional admission into the CS graduate program

**Instructor:** Dr. Richard Borie, borie@cs.ua.edu, office 116 Houser Hall

**Office hours:** Tuesday and Thursday, 11:00 to 1:30

**Course schedule:** A tentative schedule of lecture topics, exam dates, homework and project 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 2007 edition at the Supply Store in Ferguson Center.]

**Languages:** It is expected that you are previously familiar with languages in the C/C++/Java family. It is also expected that you can quickly learn the fundamentals of other languages such as Scheme, ML, Smalltalk, and Prolog.

### **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).
- 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.

### **Assignments and grade computation:**

- Homework problems (individual) → 10 %
- Programming projects (in teams of up to three students) → 10 %
  - Project requirements might increase with larger number of team members.
  - Individual accountability will be ensured via exam questions.
- Three midterm exams → 45 % to 60 % total (each exam is 15 % to 20 %)
- Final exam → 20 % to 35 %
  - Actual percentages will be selected within the above ranges to produce the highest possible average for each student.

- All exams are closed-book. However, you may bring one 8½-by-11 sheet of paper with notes to each midterm, and you may bring up to four such sheets for the final.
- To prepare for each exam: Solve the homework and other exercises found at the end of each chapter, and within some lecture notes. Practice by working the exams from previous years (2006 is most similar). Participate in implementing each project, as some exam questions will relate to the projects.

### **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.