

SPRING 2006 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: MWF 10-11 and MW 12-2

Course schedule: A tentative schedule of lecture topics, exam dates, 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 (2nd edition, manuscript)

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 basics of other languages such as Scheme, ML, Smalltalk, and Prolog.

Topics:

- Introduction, design of a simple interpreter (Chapters 1-2)
- Implementation of functional programming (Chapters 3-5)
- Type systems and type inference (Chapters 6-7)
- Implementation of object-oriented programming (Chapter 9)
- Implementation of logic programming (Chapter 10)

Goals:

- 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:

- Programming projects (in teams of up to three students) → 20%
- Homework problems, quizzes, in-class exercises, and/or attendance → 10%
- Two in-class closed-book midterm exams → 40%
- An in-class closed-book final exam → 30%

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.