

91.301 Organization of Programming Languages, Spring 2004 Syllabus

Contact Information

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Class Meetings

Tuesday and Thursday, 10:00-11:15, Olsen 414

Office Hours

Tuesdays 2:30 to 3:30 in Olsen 304
Wednesdays 1:00 to 2:30 in Olsen 304
Thursdays 3:00 to 4:00 in Olsen 304

You may also make an appointment with me if you can not make it to the scheduled office hours.

Course Description

We will study programming languages using Scheme. We describe salient semantic features of various programming language paradigms including the imperative, functional, logical, and object-oriented approaches. Key concepts include: building abstractions, computational processes, higher-order procedures, compound data, data abstractions, controlling interactions, generic operations, self-describing data, inheritance and message passing, streams and infinite data structures, meta-linguistic abstraction, interpretation of programming languages, machine model, compilation, and embedded languages.

Textbook

Structure and Interpretation of Computer Programs, Second Edition. Harold Abelson and Gerald Jay Sussman with Julie Sussman. MIT Press, 1996

The full text of the book is available on the web at
<http://mitpress.mit.edu/sicp/full-text/book/book.html>

Course Website

<http://www.cs.uml.edu/~holly/91.301>

Software

For the course, you may use MIT Scheme or Dr. Scheme. Both are available for free downloads (info about downloading will be put on the course web site), and both should be installed in the CS labs. There are advantages and disadvantages to each. Dr. Scheme has a nicer, WYSIWYG-type interface, while MIT Scheme uses an emacs-like editor. However, MIT Scheme has a debugger, and Dr. Scheme does not. I would recommend learning to use MIT Scheme, since it will make things easier for you in the long run.

Exam Dates

Exam 1: Tuesday, 23 March 2004, in class
Exam 2: Tuesday, 27 April 2004, in class
Final Exam: To be determined by the Registrar

Grading

Homework	30%
Exam 1	20%
Exam 2	20%
Final Exam	30%

Collaboration Policy

You must do the homework assignments individually. You may discuss the questions with your classmates away from a computer, but you must sit at a computer and program by yourself. To learn, you'll need to actually program in Scheme, not watch another person do it.

Homework Policy

Assignments must be turned in on the date they are due in order to receive full credit. Assignments may be passed in up until the next scheduled class meeting to receive 50% credit. After the next class meeting, no credit will be received for assignments, but you may turn them in to have your code read and commented upon.

Class Schedule

Date	Topic	Reading	Assignment
Th 1/29	Course overview Introduction to Scheme	1.1	
T 2/3	More Scheme intro Substitution model	1.1	1 out
Th 2/5	Orders of growth Recursion and iteration	1.2	
T 2/10	Higher-order procedures	1.3	1 due, 2 out
Th 2/12	Compound data Data abstraction	2.1	
T 2/17	Aggregate data: lists	2.2	2 due, 3 out
Th 2/19	Monday schedule		
T 2/24	Aggregate data: trees	2.2	
Th 2/26	Henderson picture language	2.2.4	3 due, 4 out
T 3/2	Symbolic data	2.3	
Th 3/4	Data structures	2.3, 2.4	4 due, 5 out
T 3/9	Multiple representations of data	2.4	
Th 3/11	Generic Operators	2.5	5 due
T 3/16	Spring break		
Th 3/18	Spring break		
T 3/23	Exam 1, includes material from lectures through 3/4		
Th 3/25	State	3.1	6 out
T 3/30	Environment model	3.2	
Th 4/1	Object-oriented programming	Handout	6 due, 7 out
T 4/6	Mutable data	3.3	
Th 4/8	More mutation	3.3	7 due, 8 out
T 4/13	Streams	3.5	
Th 4/15	Streams	3.5	8 due, 9 out
T 4/20	Metacircular evaluator	4.1	
Th 4/22	Metacircular evaluator	4.1	9 due
T 4/27	Exam 2, includes material from lectures through 4/15		
Th 4/29	Logic programming and pattern matching	4.4	10 out
T 5/4	More on MC eval: lazy evaluation	4.2	
Th 5/6	More on MC eval: lazy evaluation	4.2	10 due, 11 out
T 5/11	Memory management and garbage collection	5.3	
Th 5/13	OPL Jeopardy		11 due
TBD	Final Exam		