

Course Syllabus

The following is a sequence of lecture topics, readings for each topic, and important dates. Numbers in the Readings column indicate sections of the course text Structure and Interpretation of Computer Programs by Abelson and Sussman.

1 Introduction

Introduction and Overview

Topics:	Lectures:
Administration	01/16/02
Course Overview	Reading: None
Scheme: What is it?	
Emacs is your friend	

2 Procedural Abstraction

Functional Programming

Topics:	Lectures:
The substitution model for evaluation	01/18/02
Procedures are data: The lambda special form	01/21/02
Conditional expressions	Reading: 1.1
Local Names	

Recursion and Iteration

Topics:	Lectures:
Recursive procedures	01/23/02
Recursive processes	01/25/02
Iteration	01/28/02
Orders of growth	Reading: 1.2

High Order Procedures

Topics:	Lectures:
High order Procedures	01/30/02
Procedures as parameters	02/01/02
Procedures as return values	02/04/02
Procedures as General methods	Reading: 1.3

Abstract Data

Topics:	Lectures:
Abstraction barriers	02/06/02
Abstraction violations	02/08/02
	Reading: 2.1

Hierarchical Data

Topics:	Lectures:
Sequences	02/11/02
Trees	02/13/02
Symbols	02/15/02
Pattern Matching	Reading: 2.2 -2.3

Representing Abstract Data

Topics:	Lectures:
Multiple representations	02/18/02
Manifest types	02/20/02
Data-directed programming	02/23/01
Message Passing	Reading: 2.4

3 Objects, Modularity, and State

State

Topics:	Lectures:
Local state	02/25/02
Assignment	03/04/02
The substitution model revisited	
The costs and benefits of assignment	Reading: 3.1

The Environment Model of Evaluation

Topics:	Lectures:
Environment	03/06/02
The environment model of evaluation	03/08/02
Environment diagrams	Reading: 3.2

Mutable Data

Topics:	Lectures:
Queues	03/18/02
Tables	03/20/02
	03/22/02
	Reading: 3.3

Object Oriented Programming

Topics:	Lectures:
Objects	03/25/02
Inheritance	03/27/02
	03/29/02
	Reading: 3.1- 3.3

Concurrency

Topics:	Lectures:
The Nature of Time	04/01/02
Controlling Concurrency	04/03/02
	Reading: 3.4

Streams

Topics:	Lectures:
Streams	04/05/02
Infinite streams	04/08/02
Implementing streams	04/10/02
Streams and delayed evaluation	Reading: 3.5

4 Metalinguistic Abstraction

The Metacircular Evaluator

Topics:	Lectures:
Using Scheme to evaluate Scheme	04/17/02
Representing expressions	04/19/02
Evaluating expressions	04/22/02
Operations on environments	04/24/02
	Reading: 4.1

Lazy Evaluation

Topics:	Lectures:
Normal Order and Applicative Order	04/26/02
An Interpreter with Lazy Evaluation	
Lazy Lists	Reading: 4.1

Logic Programming

Topics:	Lectures:
Deductive Information Retrieval	04/29/02
How the Query System Works	05/01/02
Implementing the Query System	Reading: 4.1

Important Dates

Problem Sets

- 01/28/02 – Problem Set #1 Due
- 02/05/02 – Problem Set #2 Due
- 02/18/02 – Problem Set #3 Due
- 03/04/02 – Problem Set #4 Due
- 03/25/02 – Problem Set #5 Due
- 04/08/02 – Problem Set #6 Due
- 04/22/02 – Problem Set #7 Due
- 05/01/02 – Problem Set #8 Due

Exams

- 03/01/02 – Midterm Exam
- TBA – Final Exam