Objectives for Course CSCI344

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1 Course Description (SIS)

This course is a study of the syntax and semantics of a diverse set of high-level programming languages. The languages chosen are compared and contrasted in order to demonstrate general principles of programming language design and implementation. The course emphasizes the concepts underpinning modern languages rather than the mastery of particular language details. Programming projects will be required.

A ‘Dissection’ of the Description

The description says we will be covering this stuff:

- syntax and semantics;
- a diverse set of languages;
- and principles and concepts underlying modern languages.

Course Chunks

The course structure has these rough chunks. After working on processing, the course will interweave the exploration of models with exploration of general language features.

- Processing
  Interwoven with Processing is the introduction to the course. There we’ll start discussing some history, kinds of languages, and the processing and translation of a language into machine code.
  Then we’ll look into the processing a programming language does by doing an implementation of a tiny language. That will give you a feel for implementing the syntax and semantics of a language and the inner workings of a language processor.

- Models-Paradigms
  We will experiment with functional and logical languages, as well as languages that have concurrency features. We’ll also work with languages that lack features you may normally expect to be present.

- Types And Control
  We will examine features of languages including approaches to control flow, subroutines, types, and object-orientation.

- Learning to Learn Languages
  A cross-cutting goal is that we learn how to learn a new language and apply it to a problem. Sometimes the language is well-suited to the problem, and other times it is not. When there is not the best fit, we have to learn to be creative to resolve the issues...