Principles of Programming Languages

Course Number: 20-ECES-730
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Here is some administrative information on the course.

Classroom 500 Swift Hall
Time TuTh 3:30-4:45PM
Office Hours Thursday 5-6:30PM
Midterm May 1, 2001
Final 7:30-9:30AM, Thursday, June 7, 2001
Grade Homework(30%) + Midterm(30%) + Final(40%)

Principles of Programming Languages is a course that teaches various fundamental principles in programming language design and implementation.

It is an undeniable fact that the demand for software is skyrocketing at present. Unfortunately, the current practice of software construction seems far inadequate to meet such a demand. For instance, faulty and fragile software is becoming more and more common, security breaches are happening at an alarming rate, programming productivity stagnates at an incredibly low level, and software maintenance cost is soaring rapidly. Effective approaches to addressing these problems have been highly sought after since they possess the potential to significantly impact the future software industry.

Evidently, programming languages have a tremendous impact on software construction. Ideally, a programming language should be simple and general, and it should permit extensive error checking, facilitate proofs of program properties and possess a correct and efficient implementation. Invariably there will be some conflicts among these goals which must be resolved with careful attention to the needs of the user. This prompts us to study the principles that are fundamental to the design and implementation of programming languages as well as to software construction.

The purpose of this course is to introduce the basic principles and results in programming language studies to students who have already become familiar with programming. Given the limited time, it is certain that we can only cover a small portion of various significant and interesting topics in programming languages. Therefore, I intend for students to concentrate on a few topics that can lead to both a basic understanding of programming language theory and an appreciation for the rigorous analysis of programming concepts.

The following are some major topics that are to be covered in this course.

1. Introduction to modern programming languages
2. Dynamic semantics
3. Static symnatics
4. Type soundness
5. Control flow and Data flow
6. Correctness of compilation

Please find more information on the homepage for the course at:

http://www.ececs.uc.edu/~hwxi/academic/courses/eces-730/eces-730.html