

Introduction to CS320

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- ▶ *Concepts of Programming Language* is a course that introduces students to some fundamental concepts in programming language design and implementation.
- ▶ The primary goal of the course is to allow the students who complete the subject to have
 - ▶ a good feel for the elements of style and aesthetics of programming, and
 - ▶ a strong command of certain major techniques for controlling complexities in programming.

- ▶ Faulty and fragile software is norm rather than exception
- ▶ Security breaches happen at an alarming rate
- ▶ Maintenance cost is skyrocketing
- ▶ Programming productivity stagnates

- ▶ Building abstractions with procedures (functions)
 - ▶ This practice is essential to effectively controlling complexity in constructing large systems
- ▶ Building abstractions with datatypes
 - ▶ This practice is essential to effectively handling large complex data structures

- ▶ Elements of Programming in ATS
 - ▶ Lists and Trees
 - ▶ Functions
 - ▶ Recursion
 - ▶ Datatypes and Pattern Matching
 - ▶ Polymorphism (Generics)
 - ▶ Higher-order Functions (Functions as first-class values)
 - ▶ Input and Output
 - ▶ ...

What is this course like?

- ▶ It requires that you do a significant amount of programming.
 - ▶ You will need to program in the functional programming language ATS, which demand a programming style that may seem unnatural or counterintuitive to you at the beginning.
 - ▶ You are expected to read documentation and learn certain essential debugging skills.
 - ▶ There will be 6 assignments, each of which involves some amount programming.

What is this course like?

- ▶ It proceeds in a fast pace (it is even more so given that this is a summer course).
 - ▶ You are expected to read text that we may not have time to cover in class.
 - ▶ You are expected to try programming examples that we may not have time to explain in class.
 - ▶ You may need to take notes on materials that are not present in the textbook.

What is this course like?

- ▶ You are to have rapid exposure to many fundamental concepts in programming.
- ▶ You are expected to gain a lot more understanding of programming, which can greatly help you pursue other topics in computer science.
- ▶ Above all, I do hope that you will find a great deal more fun in programming after taking this course.

What is this course not like?

- ▶ This is not a course about your top 10 favorite programming languages.
 - ▶ We are interested in fundamental programming concepts
 - ▶ We are not so concerned with “fads” .
- ▶ This is not a compiler course, though it can be of great help for you to take a compiler course later.

Warnings

- ▶ This is likely to be a challenging course for you as many new (and thus unfamiliar) concepts are to be introduced rapidly.
 - ▶ You may need to give some time for certain concepts to “sink in”.
 - ▶ You may find that some programming assignments are difficult and demanding.
 - ▶ Please do ask for help if you need it.

- ▶ I may make mistakes.
- ▶ I can be a bit overly ambitious.
- ▶ I will do my best to run this course smoothly.
- ▶ Please ask questions. A lot of them!

Academic Integrity

- ▶ All the work you turn in must be **solely your own** unless specified otherwise.
- ▶ You are allowed (actually encouraged) to discuss problems with your classmates. However, you must write your own code and solution.

The End

Questions?