

# *Concepts of Programming Languages*

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# *Welcome!*

- *Concepts of Programming Languages* 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 students who complete this subject to have
  - a good feel for the elements of style and aesthetics of programming, and
  - a strong command of the major techniques for controlling complexity in a large system

# *Software Crisis*

- Faulty and fragile software becomes more and more common
- Security breaches happen more and more frequently
- Maintenance cost skyrockets
- Programming productivity stagnates

# *Course Overview*

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- Building Abstractions with Procedures
  - This practice is essential to controlling complexity in building large systems
- Building Abstractions with Data
  - This practice is essential to handling complex data structures

# *Course Overview*

- Some Elements of SML
  - Lists and trees
  - Functions
  - Recursion
  - Pattern-matching
  - Polymorphic type-checking
  - 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 need to program in the functional programming language *SML*, which may demand a programming style that seem rather unnatural or counterintuitive to you at the very beginning
  - You are expected to read the documentation and learn some essential debugging skills
  - You are to be given about 8 homework assignments, all of which involve some amount of programming

# *What is this course like?*

- It proceeds in a fast pace
  - You are expected to read the 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 the materials we cover that are not in the textbook, though I will minimize the need for note-taking by providing you with as many notes as possible

# *What is this course like?*

- You are to have a rapid exposure to many fundamental concepts in programming languages
- You are expected to gain a great deal more understanding of programming, which can be really helpful for you to pursue other subjects in computer science
- Above all, I hope that you will find a great deal more fun in programming



# *What is this course not like?*

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

# *Warnings*

- This is likely a challenging course for you as many new and unfamiliar concepts in programming languages 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 ask for help if you need it: ask it sooner rather than (too much) later

# *Pleas*

- I am likely to be a bit overly ambitious, and
- I am certain to make (quite a few) mistakes, but
- I will do my best to make the course run as smoothly as possible
- Please be patient and ask (a lot of) questions!

# ***Important Course Information***

- Lecture Times: 11:00AM-12:30PM
- Classroom: MCS B33
- Course Homepage:  
<http://www.cs.bu.edu/~hwxi/academic/courses/CS320.html>
- Instructor: Hongwei Xi
- Teaching Fellow: Likai Liu
- Office Hours: To be announced
- Grades Calculation:

**30% (homework) + 30% (midterm1+midterm2) + 30% (final) + 10% (participation)**

A: 85% or above

B: 75% or above

C: 65% or above

D: 60% or above

# *Academic Integrity*

- Strict adherence to the university guidelines
  - All work you turn in must be solely ***your own*** unless specified otherwise
  - You are allowed to discuss problems with your classmates but you need to write your own code and solutions
  - Please always remember that every student deserves a chance to achieve a fair grade

***The End***

