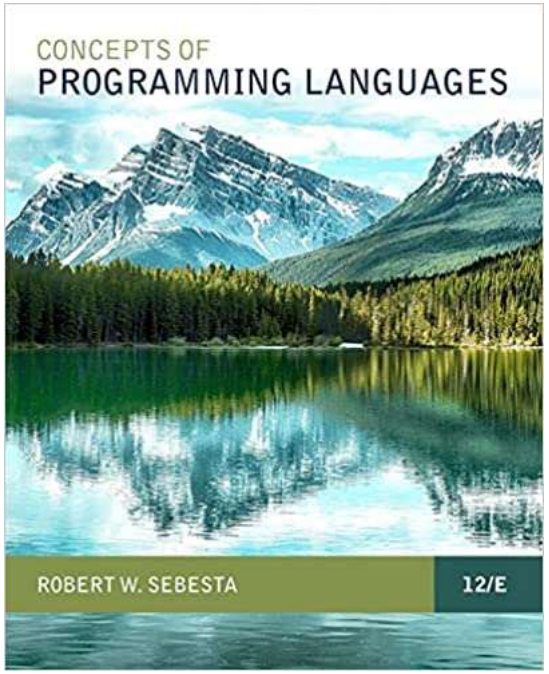
Welcome to CS4080



Concepts of Programming Languages

Spring 2025

- Canvas supported teaching
- Group based discussions

Introduction to CS4080

- Concepts of Programming Languages
  - *Focus: study and evaluate the features of programming languages*
  - *Breadth, not depth;*
  - *Encourages critical thinking and innovative design*
- Things you'll be learning:
  - The Art of Language Design
  - Principles and trade-offs behind the language design and features
  - Compare and contrast programming languages and language features

Why Study (Concepts of) PLs?

- The study of programming languages is valuable for a number of reasons:
  - Increase our capacity to use different constructs
  - Enable us to choose languages more intelligently
  - Make learning new languages easier
  - Train our ability to design new programming languages (though such opportunities are rare for our graduates)

How many programming languages do you need to know?

- The more the better …
- Requirements:
  - Java (a deep understanding of language feature)
  - C++ (not enforced but hope most of you having a basic understanding of syntax and features)
  - Pseudo code
    - Be able to understand pseudo codes, compare and analyze features of various languages
- Learning new languages
  - Group assignments
  - Capstone project
- Focus: Language "features"

Active Learning Strategies

- Lectures
  - Fundamental features of programming languages
  - Java and C++ (plus some Python) as examples
- Group Activities
  - How these features reflected in contemporary languages
    - e.g. Python, Ruby, Swift, Dart, …,

Students' Responsibilities

- Student-Content Interactions (S|C)
  - Read textbook, lecture notes, references (e.g. online language reference manuals)
- Student-Instructor Interactions (S|I)
  - Participate in Lecture discussions (questions, polls, …)
  - Canvas discussions, emails, office hours, …
    - Not for credit, but strongly encouraged
- Student-Student Interactions (S|S)
  - Actively participate in group activities
    - Group assignments will be shared during class meetings
    - Every member of a group should participate in sharing

Course Information

- Canvas
  - Syllabus, Course Schedule
  - Lecture Slides, Assignments, Exams
  - Announcements, Questions and Discussions
- Group Activities
  - Active learning
- Textbook requirement
  - Any format (paper, ebook, …)
  - 12th edition preferred, 11th edition may also work

Group Activities

- Join a group at week 1
  - Ideally 4 members per group
  - Groups already created on Canvas -> People
    - The language name is the group name
    - Each language will have A and B two groups
    - Choose a group with the language new to you, and you'd like to learn it
- Group can be adjusted for capstone project
  - Change of group afterwards will incur a penalty
- Weekly group activities
  - For each group assignment, work together
    - Any collaboration platform, e.g. Discord
  - Share during lectures
    - Requirements will be specified in activity assignments.

Quizzes and Exams

- Quizzes
  - Recap of reading assignments
  - Time allocated during class meeting
    - However, allowed to complete by the end of the day
- Exams
  - Must be taken in the classroom
  - Sign in required

“Informal” Absence Policy

- No roll calls for lecture meetings
  - If you miss, make up by yourself by reading textbook/slides
  - No complain to others if not catching something important
- Group Activities
  - Attendance mandatory for group presentations
    - Everyone needs to attend
    - See Activity 1 for details
- Exams
  - Must take in the classroom, except
    - (approved) Individual absences will be referred to CPP test center or DRC
    - Possible to have the whole class taking the test on Canvas on the test day

Excused Absences

- Excused absence must be approved by the instructor
  - Case by case consideration
  - Consideration given to serious health reasons, family emergencies
  - Supporting documentation required
    - e.g. doctor's note (official document, not personal statement)
  - With prior arrangement or immediate notification
    - But you don't have to message me while driving …
- Must request test makeup and/or due date extensions prior to test time or assignment due time
  - Email instructor for special arrangements
- Should consider withdrawal or I-grade (incomplete) for extended absence

Programming Projects

- Mini programming projects
  - Individual
  - Integrated in homework assignments
  - Feature-based: compare and contrast different implementations of the same feature
    - E.g. performance of different types of arrays
    - E.g. performance of static and dynamic binding in OOPs
- Capstone project
  - Team
  - Exploring new languages
  - Implementing practical use cases (i.e. applications)

Use of AI Tools for Class Works

- Updated Syllabus
- Not allowed in general
  - Generative artificial intelligence (gAI) tools such as ChatGPT, DALL-E, Grammarly, etc.
- Special cases
  - Team project etc. if the topic related to such tool(s)
  - must be appropriately acknowledged and cited.
- Penalty for unauthorized use of AI tools
  - May result in a failing grade for the assignment, with more severe penalties possible in consultation with Student Conduct.
- Any questions about it
  - You are encouraged to talk to me

Key to a good grade

1. Read the textbook.

2. Attend the lecture regularly and actively participate in group based activities.

3. Complete all the assignments on time.

4. Establish your own thinking/judgement towards the design features

   e.g. use your own words in analyzing/describing homework or test problems.

Your hard work will lead you towards success!

If you spot any errors in lectures, assignments, etc. please drop me a message.

Appreciate it!

Let’s explore

Syllabus – read it completely!

Lecture Schedule

Any change will be updated on Canvas

Course Content

Canvas Home ⇔ Syllabus

Summary

Learning Objectives

- After Lecture 0, you should be able to:
  - Tell course requirements
  - Navigate course materials on Canvas
  - Accept rules and remarks spelled out in the syllabus