COURSE SYLLABUS

COURSE NAME	**Nature of Programming Languages**
CODE	**CS 3370**
TERM	**Spring Semester 2026**
LOCATION	**Hanoi University of Science and Technology**
CLASS HOURS	**Monday & Wed (8.30AM - 11.15AM)**
WORTH	**3 credits**
PREREQUISITE	**CS 3323, CS 3365**
INSTRUCTOR	**Dinh-Han Nguyen, PhD**
	han.nguyendinh@hust.edu.vn

Description

General criteria design, implementation, and evaluation of programming languages. Historical prospective. Syntactic and semantic specification, compilations, and interpretation processes. Comparative studies of data types and data control, procedures and parameters. Sequence control, nesting, scope and storage management, run-time representations. Non-standard languages, problem-solving assignments in a laboratory environment. Prerequisites: CS 3323 and CS 3365.

Objectives

At the completion of this course, students should be able to do the following:

- Master fundamental concepts that underline programming language syntax and semantics.
- Understand benefits of and be able to program in different programming languages.
- Understand benefits of and be able to apply appropriate programming paradigms to software development projects.
- Gain insight into problem of designing new programming languages.
- Coordinate a programming language design and implementation project and work with other team members to build deliverables along the way.

Required Books

Kenneth C. Louden and Kenneth A. Lambert (2011) *Programming Languages: Principles and Practice*. Third Edition. Cengage Learning.

Weekly Schedule

Week	Topic	Book Reference	Homework
1	Introduction	Page 1- 23	
2	History	Page 1-23	Quiz 1
3	Language Design Principle	Page 25-43	Quiz 2
4	LAB 1 – Imperative programming	Page 148-202 In class demonstration + practice + Self training	Homework 1

Troy University Resources

5	LAB 2 – Object-oriented programming 1	Page 45-101 In class demonstration + practice + Self training	Homework 2
6	Syntax	Page 203-254	Homework 3
7	Basic Semantics	Page 255-323	Homework 4
8	Data Types	Page 325-399	Homework 5
9	Mid-term Exam		
10	Control I – Expressions and Statements	Page 401-442	Homework 6
11	Control II – Procedures and Environments	Page 443-490	Homework 7
12	Abstract Data Types and Modules	Page 491-540	Homework 8
13	LAB 3. Object–Oriented Programming 2	Page 148-202 In class demonstration + practice + Self training	Homework 9
13	LAB 4. Functional and Logic Programming	Page 45-101 In class demonstration + practice + Self training	Homework 10
15	Final Exam and Presentation		

Quiz and Homework and Presentation.
Quiz 1. Exercise 1.17,1.18,1.19,1.20 (page 22)
Quiz 2. Exercise 2.1 (page 40), 2.11, 2.12 (page 41)
Homework 1. Imperative programming in Python
Homework 2. Object-oriented programming in Python
Homework 3. Formal definition for syntax of programming languages
Homework 4. Exercises on scanner and parser generator
Homework 5. Exercises on data types
Homework 6. Exercises on various programming constructs
Homework 7. Exercises on various programming constructs
Homework 8. Exercises on ADT and modules
Homework 9. Module and object-oriented programming in Python
Homework 10. Functional programming in Standard ML and Logical programming in Prolog

Grading
Attendance (30%) + Quiz and Homework and Midterm Exam (40%) + Final Exam and Presentation (30%)
90 - 100: A; 80 - 89: B; 70 – 79: C; 60 – 69: D; 59 and below F

Teams code: vp3r62t