



Assumption University  
Vincent Mary School of Science and Technology  
Department of Computer Science



Course Outline  
**CSX3004 Programming Languages**  
Semester 2/2023

**Course status:** Major required course      3 credits  
**Pre-requisite:** CSX3002 Object-Oriented Concepts and Programming

**Instructor:** Dr. Kwankamol Nongpong  
**Office:** VMS 0507  
**E-mail:** kwan@scitech.au.edu

**Class Meetings:** Section 541      Wed. 9:00-12:00 hrs.      VMS 307

**Office Hours:** Wed. 14:00-15:30 hrs.  
Fri. 9:00-12:00 hrs.

**Textbooks:**

**Modern Programming Languages: A Practical Introduction** (Second Edition). Adam Webber. Franklin, Beedle & Associates, 2010.

**Seven Languages in Seven Weeks: A Pragmatic Guide to Learning Programming Languages.** Bruce Tate. Pragmatic Programmers, LLC. 2010.

**References:**

**Programming Languages Concepts & Constructs.** Ravi Sethi. 2nd Ed., Addison-Wesley, 1996.

**Standard ML of New Jersey User's Guide.** <http://www.smlnj.org/doc/index.html>.

**The Java Tutorial.** <http://java.sun.com/docs/books/tutorial/index.html>.

**SWI-Prolog Reference Manual.** <http://gollem.science.uva.nl/SWI-Prolog/Manual>.

**Course Description:**

A study of the computer programming languages on comparative basis with special consideration on syntax, semantics, and implementation, emphasizing the suitability of programming languages for various data manipulations and situations. The topics include bindings, type checking, visibility rules, abstract data type, object oriented constructs and exception handling.

**Course Objectives:**

Students will learn three main programming language's paradigms: functional, object-oriented, and logical. They will be able to write programs in ML, Java, and Prolog. They will understand the main concepts and characteristics of each paradigm. Six additional programming languages will be assigned so that students are exposed to other languages and learn how learn new programming languages quickly. They will be able to compare programming languages and choose the proper language to solve real-world problems.

**Schedule:**

Week	Topic	Reading	Assignment	Due
1	Course Administration	Ch. 1		
	Introduction Program Syntax	Ch. 2	A1	
2	Syntax and Semantics	Ch. 3		
	Language Systems	Ch. 4	A2	A1
3	Introduction to ML	Ch. 5		
	Types	Ch. 6	A3	A2
4	ML Patterns and Nested Functions	Ch. 7		
	Polymorphism	Ch. 8	A4	A3
5	Higher-Order Functions	Ch. 9		
	Scope	Ch. 10	A5	A4
6	ML Data Types	Ch. 11		
	Memory Locations for Variables	Ch. 12	A6	A5
7	Seven Languages Part 1: Haskell, Clojure, Ruby			A6
8	Presentation: Mini Project 1			
<b>MIDTERM EXAMINATION</b> <b>January 12, 2024 9:00-11:00</b>				
9	Introduction to Java	Ch. 13		
	Memory Management	Ch. 14	A7	
10	Java Classes	Ch. 15		
	Object Orientation	Ch. 16	A8	A7
11	Exceptions	Ch. 17		
	Parameters	Ch. 18	A9	A8
12	Introduction to Prolog	Ch. 19		A9
13	Procedural Prolog	Ch. 20	A10	
14	Cost Models	Ch. 21		A10
15	Seven Languages Part 2: Io, Scala, Erlang			
16	Presentation: Mini Project 2			
<b>FINAL EXAMINATION</b> <b>March 18, 2024 9:00-12:00</b>				

**Grading:**

Class discussion, Quizzes, Assignments	10%
Term Project and Report	30%
Midterm Examination	25%
Final Examination	35%

Students are expected to read the textbook or lecture notes before they come to class. There will be a quiz at the beginning of each class. Questions will cover materials in the required reading of that class. Each quiz will last about 5-10 minutes. Therefore, students should be on time or they will miss the quiz.

There will be ten assignments in total. Some are written and some are programming assignments. Assignments are due one week after they are assigned (see the schedule above). **Late assignments will not be accepted.**