University of Nicosia, Cyprus

Course Code	**Course Title**	**ECTS Credits**
COMP-411	Programming Languages	6
Department	**Semester**	**Prerequisites**
Computer Science	Fall, Spring	COMP-211
Type of Course	**Field**	**Language of Instruction**
Elective	Computer Science	English
Level of Course	**Year of Study**	**Lecturer(s)**
1st Cycle	4th	Dr Ioanna Dionysiou
Mode of Delivery	**Work Placement**	**Co-requisites**
Face-to-face	N/A	None

Objectives of the Course:

The main objectives of the course are to:

- master design language concepts such as syntax and semantics
- provide student with deep knowledge on programming language constructs such as values, variables, and types
- cover in detail program execution during runtime
- provide student with thorough knowledge on the fundamental principles for various programming paradigms, including imperative programming, object oriented programming, functional programming, logic programming, event-driven programming, and concurrent programming.

Learning Outcomes:

After completion of the course students are expected to be able to:

1. differentiate between syntax and semantics
2. design the syntax for a simple programming language
3. discuss name concepts such as scope, type checking, referencing
4. differentiate between basic types and nonbasic types
5. assess the operational semantics of programming constructs
6. describe the behavior of a function and its run-time stack
7. discuss memory management strategies for dynamic objects
8. utilize and exploit various programming paradigms (imperative, object oriented, functional, logic, event-driver, concurrent, etc) and state their differences

Course Contents:

1. Overview of programming language evolution
2. Programming language syntax (grammars, parsing)
3. Names, Binding, types, type checking and scope
4. Programming language semantics (expressions, assignment, selection, iterative, etc)
5. Subprogram issues (design, parameters, parameter passing, activation records, runtime stack)

6. Memory management
7. Fundamentals of imperative programming, object oriented programming, functional programming, logic programming, event-driven programming, concurrent programming.

Learning Activities and Teaching Methods:

Lectures, practical exercises, in-class problem solving sessions

Assessment Methods:

Homework, project, midterm exam, final exam

Required Textbooks/Reading:

Authors	**Title**	**Publisher**	**Year**	**ISBN**
Allen Tucker and Robert Nooman	*Programming Languages Principles and Paradigms (Second edition)*	McGraw-Hill	2007	0072381116

Recommended Textbooks/Reading:

Authors	**Title**	**Publisher**	**Year**	**ISBN**
Robert Sebesta	Concepts of Programming Languages (Ninth edition)	Pearson	2009	0136073476