Study programme(s): Computer science

Level: academic bachelor studies

Course title: Programming languages and paradigms

Lecturer: Zoran D. Budimac

Status: obligatory

ECTS: 7

Requirements: None

Learning objectives

Introduction of historical and practical reasons that lead to emergence of many different programming langauges, clarification of specifics, similarities and differences o several programming paradigms (object-orinted, functional, logic, multi-paradigm), with detailed description of most important characteristics of theor most influental representatives.

Learning outcomes

Minimal: At the end of the course it is expected that successful student will be able to understand fundamental concepts of various programming languages and understands importance of different programming paradigms. *Desirable:* At the end of a course it is expected that a successful student will be able to understand concepts of programming languages, to understand concepts of programming languages and importance of different programming styles, as well as to demonstrate skills of specific program development in several programming paradigms.

Syllabus

Theoretical instruction:

History of programming langauge development. Procedural and non-procedural programming langauges. Charateristics aof programming langauges and most important diffferences between them. Detailed and comparative overview of several programming styles (functional, logic, multi-paradigm,...) and their typical representatives. Syntax and semantics. Basic notions and mathematical background. Data structures.

Exercises

Comapartive overview of different approaches to implementation of standard programming tasks, and illustartion of different philosophies behind every mentioned paradigm using typical examples. Testing of given programs, tools, discussion of applicability etc. Individual practical exercises: data types, statements, data structures.

Literature

Recommended

1. Krishnamurti, S., Programming languages: application and interpretation, Brown univeristy, 2007.
2. Gabbrielli, M., Martini, S., Programming Languages: Principles and Paradigms, Springer, 2010.

Weekly teaching load				Other:
Lectures: 2	Exercises: 1	Practical Exercises: 2	Student research:	

Teaching methodology

Classical teaching methods are used for theoretical instruction using video beam projector. Theoretical exercises are used to discuss and analyze principles, typical problems and their solutions and model own programs. Practical exercises are used for individual application of taught techniques.

Grading method (maximal number of points 100)

Pre-exam oblications	**Points**	**Final exam**	**points**
Assignments	**30**	Oral exam	40
Tests	**30**		