

SYLLABUS

SUBJECT: LANGUAGES AND PROGRAMMING PARADIGMS

TEACHER: PAWEŁ DELIMATA, PhD

COURSE DESCRIPTION:

An overview of the imperative programming paradigm, object-oriented, functional and logical. Deepening the skills of the two imperative programming languages (Pascal and C) and an object-oriented language (Java). One of the aims of the course is also to acquaint the students with the accounts of lambda and sigma and to introduce them the functional language (Haskell), and logical language (Prolog).

LECTURE:

The lecture focuses on a programming paradigm and explains what it is, semantics of variables, types, abstract types, subroutines, object - oriented programming - an overview, a functional programming - an overview, programming in logic - an overview, at the core of functional programming - lambda, at the core of object-oriented programming - sigma, functional programming in Haskell, logic programming with Prolog.

CLASSES:

The classes focuses on the practical aspects of semantics of variables, types, abstract types, subroutines, object-oriented programming - an overview, functional programming - an overview, programming in logic - an overview, at the core of functional programming - lambda, at the core of object-oriented programming - sigma, functional programming in Haskell, logic programming with Prolog.

LEARNING OUTCOMES:

The consolidation and skills deepening in the imperative programming and object-oriented languages. The acquisition of skills in the functional and logical languages.

GRADING POLICY:

LECTURE: Grading based on class participation.

CLASSES: Two written tests and short questions before classes.

TIMETABLE:

LECTURE: 2 hours/every week

CLASSES: 2 hours/every week

TEXTBOOK AND REQUIRED MATERIALS:

1. R. Sebesta, *Concepts of Programming Languages*, Addison Wesley, 2005.
2. P. Van Roy, S. Haridi, *Concepts, Techniques, and Models of Computer Programming*, MIT Press, 2004.
3. K. Arnold, J. Gosling, *The Java Programming Language* Addison Wesley, 2005.
4. R. Bird, *Introduction to Functional Programming using Haskell*, Prentice Hall, 1988.
5. M. Abadi, L. Cardelli, *A Theory of Objects*, Springer, 1996.
6. J. Reynolds, *Theories of Programming Languages*, Cambridge University Press, 1998
7. U. Nilsson, J. Małuszyński, *Logic, Programming and Prolog*, John Wiley & Sons, 1995.

PREREQUISITES:

An understanding of computer architecture and Java and C programming skills.