

Course title: Principles of programming languages

Course code: 63220

ECTS: 6

Professor: Andrej Bauer

Prerequisite knowledge (please be specific if possible):

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Short course description (max half of the page):

Computational models and programming paradigms: imperative, procedural programming, declarative, non-procedural programming, functional programming, logic and relational programming, programming with constraints, parallel programming, genetic programming, programming by examples, etc.

Overview of programming languages for various programming paradigms

Elements of languages for imperative programming

Declarative programming, logic programming and the Prolog language: logic as a programming language, procedural meaning of programs as automatic theorem proving, examples of symbolic programming and declarative program design

Programming with constraints: ideas, principles and examples, constraint logic programming (CLP)

Handling of syntax and semantics of programming languages: grammars, operational, translational, denotational and axiomatic semantics

Denotational semantics, relation to the grammar of a language, examples of denotational definitions

Axiomatic semantics and proving correctness of programs: partial and total correctness, invariant conditions, techniques of proving program correctness, using weakest preconditions, automatic correctness proving