Study programmes: Master studies - Informatics

Course name: R344 - Functional Programming

Lecturers: Nenad Mitić and other lecturers at Department of computer Science

Status: Optional

ECTS: 8

Attendance prerequisites: -

Course aims: Mastering general and specific knowledge about the functional programming paradigm, functional programming languages and applications.

Course outcome: After completion of the course, the students have adopted the elementary concepts and techniques of functional programming and the properties of functional programming languages. Also, the students are prepared to reason in a functional way and to actively use FPLs.

Course content:

- Declarative programming, comparison to imperative programming.
- Functional programming languages. Elements and characteristics of contemporarz functional programming languages.
- Higher order functions. Partial function application.
- Lazy evaluation. Infinite data structures.
- Lambda expressions, graph reduction, combinators.
- Typechecking in programming languages.
- Functional programming languages implementation, abstract machines, virtual machines.
- Automatic garbage collecting - algorithms and implementations.
- The application of functional programming languages.

Literature:

1. Functional Programming, Anthony J. Field, Peter G. Harrison, Addison Wesley, 1989
2. Introduction to Functional Programming, Richard Bird, Philip Wadler, Prentice Hall, 1988
3. Basic Polymorphic Typechecking, Cardelli, L., Science of Computer Programming, 8(2), 147-72, April, 1987

(The lecturer can choose another relevant current literature)

Number of hours: 5	**Lectures:** 2	**Tutorials:** 3	**Laboratory: -**	**Research: -**

Teaching and learning methods: Frontal lectures, group and individual tutorials and exercises.

Assessment (maximal 100 points)

Course assignments	points	Final exam	points
Lectures	-	Written exam	-
Exercises / Tutorials	-	Oral exam	-
Colloquia	30	Written-oral exam	70
Essay / Project	-		