Study programmes: Master studies - Informatics

Course name: R347 - Software verification

Lecturers: Milena Vujošević Janičić, Filip Marić and other lecturers of the Department for Computer Science

Status: Optional

ECTS: 8

Attendance prerequisites: No prerequisites

Course aims: Acquiring knowledge about different approaches to bug finding, software analysis and verification.

Course outcome: After the course, students have adopted the most important static and dynamic approaches of software verification and gained practical experience with different verification tools.

Course content:

- Introduction to software verification. Motivation and applications.
- Testing techniques. Dynamic analysis and verification of software.
- Formal approaches to software verification. Формално доказивање исправности програма.
- Automated static software verification.
- Semantics of programming languages.
- Intermediate languages in software verification.
- Modeling of software behavior and of correctness conditions.
- Theories and solvers in software verification.
- Static software verification techniques.
- Model checking. Bounded model checking.
- Abstract interpretation.
- Symbolic execution.
- Counter-example guided abstraction.
- Combining static and dynamic verification.
- Software verification in the software development life cycle.

Literature:

1. J. Laski, W. Stanley: Software Verification and Analysic. Springer-Verlag, London, 2009
2. J. B. Almeida, M. J. Frade, J. S. Pinto, S. M. de Sousa: Rigorous Software Development (An introduction to Program Verification). Springer-Verlag, London 2011.
3. Research papers

(the lecturer can choose another appropriate literature)

Number of hours: 7	**Lectures: 2**	**Tutorials: 3**	**Laboratory: -**	**Research: 2**

Teaching and learning methods: Frontal/Individual/Group work/Practical work.

Assessment (maximal 100 points)

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