Study programmes: Bachelor studies – Mathematics

Course name: M1.10 Theory of Algorithms

Lecturers: Milan Božić, Zoran Petrović, Nebojša Ikodinović

Status: Compulsory

ECTS: 6

Attendance prerequisites: Introduction to Mathematical Logic

Course aims: Acquisition of general and specific knowledge of Theory of Algorithms

Course outcome: Upon completion of the course, the students have knowledge of Theory of Algorithms. The students understand the following concepts: Turing Machines, Recursive functions, Decidability and undecidability. The students know fundamental theorem of Theory of Algorithms. They will be able to solve problems in the field, and to attend advanced courses in which the acquired concept and techniques should be applied.

Course content:
Turing Machines, Recursive functions and other approaches to computability; Church's thesis. Indices and enumerations, universal functions. Decidability, undecidability and partial decidability; recursive and recursively enumerable sets. The arithmetical hierarchy. Complexity of algorithms; P versus NP problem.

Literature:
1. N. Cutland, *Computability: An Introduction to Recursive Function Theory,* Cambridge University Press, 1980
2. H. Rogers, *Theory of Recursive Functions and Effective Computability,* MIT Press, 1987;
3. Z. Ognjanović, N. Krdžavac, *Uvod u teorijsko računarstvo,* Beograd – Kragujevac 2004.

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

Teaching and learning methods: Lectures/ Tutorials

Assessment (maximal 100 points)

Course assignments	**points**	**Final exam**	**points**
Lectures	-	Written exam	30
Exercises / Tutorials	-	Oral exam	40
Colloquia	20	Written-oral exam	-
Essay / Project	10		