Computational logic - course description

General information

Course name	Computational logic
Course ID	11.3-WE-INFP-CompLogic
Faculty	Faculty of Computer Science, Electrical Engineering and Automatics
Field of study	Computer Science
Education profile	academic
Level of studies	First-cycle Erasmus programme
Beginning semester	winter term 2019/2020

Course information

Semester	1
ECTS credits to win	4
Course type	obligatory
Teaching language	english
Author of syllabus	• dr inż. Jacek Tkacz

Classes forms

The class form	Hours per semester (full-time)	Hours per week (full-time)	Hours per semester (part-time)	Hours per week (part-time)	Form of assignment
Lecture	15	1	-	-	Credit with grade
Laboratory	30	2	-	-	Credit with grade

Aim of the course

Introduce students to the basics of Boolean algebra and sentence calculus.

To familiarize students with methods of proving tautology.

Familiarizing students with the use of logic and set theory in computer science.

Prerequisites

no requirements

Scope

Propositional calculus. Syntax and semantics. The concept of tautology. Methods of proving tautology. Rights of the propositional calculus.

Sets and set elements. Defining subsets of the set. Equality of sets. Operations on sets. The laws of sets theory and the ways of proving them.

Boolean algebra. Logical functions. Minimize logical functions. Logical Function Representation Methods (BDD). Study of the satisfying of logical functions.

Logic and set theory in computer science. Logical relations.

Elements of symbolic logic and sequent calculus.

Teaching methods

Lecture: Conventional lecture.

Laboratory: Practical exercises performed on the board and using computer software.

Learning outcomes and methods of theirs verification

Outcome description	Outcome symbols	Methods of verification	The class form
Student knows and is able to interpret concepts in the field of logic and set theory, and is able to apply them to IT problems.		• a final test • a pass - oral, descriptive, test and other • a quiz	• Lecture
Studet is able to use logic, proof of assertions, graph theory and recursion to solve problems of information technology.		• a final test • a pass - oral, descriptive, test and other • a quiz	• Lecture
Student can practically use logic and set theory in computer science.		• a quiz	• Laboratory

Assignment conditions

Lecture - the main condition to get a pass are sufficient marks in written tests

Laboratory – the main condition to get a pass is to obtain positive marks from the written tests

Recommended reading

1) Mordechai Ben-Ari. Mathematical Logic for Computer Science, 2012

2) Jean H. Gallier. Logic for Computer Science: Foundations of Automatic Theorem Proving,1986,2015

3) Alfred Tarski. Introduction to Logic: and to the Methodology of Deductive Sciences

4) Richard E. Hodel. An Introduction to Mathematical Logic, 1995

5) Stephen Cole Kleene. Mathematical Logic, 1967

Further reading

Notes

Modified by dr inż. Jacek Tkacz (last modification: 30-10-2019 11:59)