Course: Nonclassical logics

Course instructors: Zoran Ognjanović

Course type: elective

Credit points ECTS: 12

Prerequisites:

Course objectives:
Introduction to the basic ideas, concepts and results of the theory of nonclassical logics, as well as practical applications in the analysis of formalized problems.

Learning outcomes:
At the end of the course, the student will get acquainted with the basic ideas, concepts and results of the theorz of nonclassical logics, and be will able to independently apply these ideas, concepts and results in scientific research within the same or some other scientific field.

Course description (outline):
Theoretical classes
Modal logics: modal language, Kripke models, reachability relations, model classes, characteristic axioms, completeness theorems, decidability, complexity; linear or branched time temporal logics, epistemic logics; tableau-based proof procedures.
Intuitionist logics: Kripke models, axiomatization, completeness, decidability.
Non-monotonic logics.
Applications in the knowledge and belief representation.
Practice classes

References:

1. G. E. Hughes, M. J. Cresswell, A Companion to Modal Logic, Methuen, 1984.
2. Joseph Y Halpern, Y. Moses, A guide to completeness and complexity for modal logics of knowledge and belief, *Artificial Intelligence* **54**, 1992, pp. 319-379.
3. Ronald Fagin, Yoram Moses, Moshe Vardi, Joseph Y Halpern, Reasoning About Knowledge, MIT Press, 1995.
4. Melvin Fitting, Intuitionistic logic, model theory and forcing, North-Holland, 1969.
5. Zoran Ognjanović, Nenad Krdžavac, Uvod u teorijsko računarstvo, FON, Beograd, 2004.

Active teaching hours: 5	Theoretical classes: 5	Practice classes:

Methods of teaching:
Classical teaching methods with video projectors and interaction with students. Students' knowledge is tested through homework and defense of seminar papers. The final oral exam checks the comprehensive understanding of the presented material.

Grading structure (100 points)
Pre-exam obligations:
• activity during classes 10 points,
• seminar paper or oral seminar 30 points,
Oral exam 60 points