

Course: Proving and category theory		
Teacher(s): Zoran Petrić		
Course status: elective		
ECTS: 12		
Prerequisites: -		
Goal Category theory and proof theory are connected in a field called General proof theory. This course introduces the student to conceptual coherence in categories, Gentzen sequence systems, and basic topological and algebraic structures that can be used to interpret derivations from various formal systems.		
Outcomes After passing the exam, the student masters the concepts of categories, functors, natural transformations, limits and colimits, adjunction, monoidal categories, coherence and is clear about the cutting elimination technique.		
Contents <i>Theoretical teaching</i> 1. Elimination of cuts 2. Categories, functors, natural transformations 3. Universal arrows, limits and colimits 4. Products, coproducts and connection with logic 5. Adjunction 6. Monads and monoids 7. Simplicial category 8. Monoidal categories 9. Coherence <i>Practical teaching</i>		
Recommended bibliography <ol style="list-style-type: none"> 1. S. Mac Lane, Categories for the Working Mathematician, Springer, New York, 1998 2. J. Lambek and P.J. Scott, Introduction to Higher Order Categorical Logic, Cambridge University Press, Cambridge, 1986 3. K. Dosen and Z. Petric, Proof-Theoretical Coherence, KCL Publications, London, 2004 4. K. Dosen and Z. Petric, Proof-Net Categories, Polimetrica, Monza, 2007 5. J. Kock, Frobenius Algebras and 2D Topological Quantum Field Theories, Cambridge University Press, Cambridge, 2003 		
Active teaching hours:	Theoretical:	Practical:
Methods of teaching Classical teaching methods are used in lectures. Students' knowledge is tested through homework and defense of seminar papers. The final oral exam checks the comprehensive understanding of the presented material.		
Knowledge estimation: (max 100 points) Pre-examination obligations: <ul style="list-style-type: none"> • activity during the lecture 10 points, • seminar paper or held seminar 30 points. Oral exam 60 points		