

Study programmes: PhD studies – Mathematics-Algebra			
Course name: Model Theoretical Algebra			
Lecturers: Milan Božić, Dragana Todorčić, Zoran Petrović			
Status: Optional			
ECTS: 9			
Attendance prerequisites: Algebra 4			
Course aims: Acquisition of general and advanced knowledge of model-theoretical algebra.			
Course outcome: Upon completion of the course, students have extended their knowledge of category theory and acquired some advanced knowledge of model theoretical algebra. They understand the following notions: diagram, types, saturated models, filters, ultrafilters, ultraproducts, model and submodel complete theories, algebraically closed fields, real closed fields, differential fields. Students know basic and more advanced theorems from these fields as well as main constructions. They are qualified to solve problems from the mentioned areas, to follow advanced courses in related fields, and are able to understand the main problems from the current research in the field.			
Course content: Applications of the compactness theorem in algebra. Diagrams and elementary embeddings. Skolem- Lowenheim theorems. Transfer theorems in algebra. Types. Saturated models. Boolean algebras. Filters and ultrafilters. Ultraproducts and Los's theorem. Quantifier elimination. Model complete and submodel complete theories. Blum's criterion. Application of model theory to algebraically closed fields, real closed fields, differential fields, Boolean algebras, Abelian groups. Basic stability theory.			
Literature: Ž. Mijajlović, <i>An Introduction to Model Theory</i> , PMF Novi Sad, 1987. D. Marker, <i>Model Theory: an Introduction</i> , Springer, 2002. G. Cherlin, <i>Model Theoretical Algebra: Selected Topics</i> , Lecture Notes in Mathematics, vol. 521, Springer-Verlag, Berlin and New York, 1976. D. Marker, M. Messmer, A. Pillay, <i>Model Theory of fields</i> , Lecture Notes in Logic 5, Springer, 1996. C. C. Chung, J. H. Kiesler, <i>Model theory</i> , North-Holland, Amsterdam, 1973.			
Number of hours: 10	Lectures: 4	Tutorials: 6	
Teaching and learning methods: Frontal / Interactive / Tutorials / Lectures / Exercises			
Assessment (maximal 100 points)			
Course assignments	Points	Final exam	Points
Lectures	-	Written exam	30
Exercises / Tutorials	-	Oral exam	30
Colloquia			
Seminars	40		