

Program		Type of studies (cycle)	Third cycle		
		Name of the program	SEE Doctoral Studies in Mathematical Sciences		
Course					
Course title		Parameter estimation			
Course code	Semester	Course status	ECTS credits	Contact hours	
	II		10	30	
Teaching staff	Teacher	Prof. Dr. Lejla Smajlović			
	Other staff	Prof. Dr. Franz Kappel, Prof. Dr. Elisaveta Pancheva			
Course goals	The course should provide a high level overview on a wide range of parameter estimation, test theory and optimal design				
Course content/topics					
<ul style="list-style-type: none"> • Point estimation theory: Output models Assumptions on the measurement process Properties of estimators Fisher information Cramer-Rao theorem • Least squares estimators: Nonlinear least squares Nonlinear least squares Linear approximation Generalized least squares Numerical methods • Maximum likelihood estimation: Normal data Non-normal data • Bayesian estimation: Choice of prior distributions Posterior distributions Highest posterior density regions Normal approximation to posterior density • Asymptotic theory: Introduction Least squares estimation Maximum likelihood estimation • Optimal experimental design: Introduction Generalized measurement procedures Probability measures on compact sets Optimal design criteria in terms of the Fisher information matrix 					
LITERATURE		Grading			
[1] Fedorov, V. V., Theory of Optimal Experiments, Academic Press, New York 1972. [2] Florens, J.-P., Marchart, M., and Rolin, J.-M., Elements of Bayesian Statistics, Marcel Dekker, New York 1990. [3] Poazman, A., Foundations of Optimum Experimental Design, Mathematics and its Applications (East European Series), Reidel Publ. Comp., Dordrecht 1986.			Criterion	Points	Cut-off points
		1.	Homework assignment	20	12
		2.	Project	50	26
		3	Final exam	30	17
		Total			100