Program	Type of studies (cycle)	Third cycle
	Name of the program	Doctoral Studies in Mathematical and Computer Science

Course

Course title	**Selected Topics in Mathematical Statistics**			
Course code	Semester	Course status	ECTS credits	Contact hours
AMAT 603	II	Elective	10	30

Aims and intended learning outcomes	The course aims to enable students to develop a rigorous understanding of the theoretical foundations of statistical inference, analyze statistical models, and apply asymptotic methods. Learning outcomes: Formally define statistical models and statistics. Prove theorems in mathematical statistics. Apply asymptotic theory. Analyze multivariate statistical models. Use statistical software.

Course content/topics

- Parametric and nonparametric statistical models
- Estimation theory
- Statistical testing theory (uniformly most powerful tests)
- Exponential families of distributions (sufficient statistics, conjugate distributions)
- Bayesian statistics (Bayes estimators, prior and posterior distributions)
- Multivariate statistics (multivariate normal distribution, MANOVA)
- Generalized linear models
- Statistical inference for stochastic processes
- Robust statistics

LITERATURE

[1] George Casella and Roger L. Berger, Statistical Inference, Duxbury Press, 2002.

[2] John A. Rice, Mathematical Statistics and Data Analysis, Duxbury Press, 2013.

[3] A. W. van der Vaart, Asymptotic Statistics, Cambridge University Press.

Grading

	Criterion	Points	Cut-off points
1.	Homework	15	8.25
2.	Project	30	16.5
3	Final exam	55	30.25
	Total	100	55