A' semester – COMPULSORY

Probability and Statistical Inference – 36 hours
Basic probability distributions, introduction to stochastic processes, probability, sufficiency, hypothesis testing, statistical theory and applications.

Computational Statistics – 36 hours
Databases, designing and managing with appropriate and up-to-date tools and ideas from the Business intelligence, R applications and other modern data visualization techniques.

Generalized Linear Models – 36 hours
Generalized Linear Models theory, use in statistical modeling and in categorical data analysis. Extension to correlated data, mixed effects and GLMM models.

Data Analysis – 36 hours
Statistical applications in Linear Regression, in analysis of variance, contemporary statistical applications in big data using R.

B' semester – OPTIONAL

A) Applied Statistics

Biostatistics – 18 hours
Basic principles of survival functions, parametric and non parametric survival data modeling and its applications.

Epidemic Models - 18 hours

Advanced Methods in Survey Sampling – 18 hours
Basic sampling theory in finite populations, subpopulation parameter estimation, using auxiliary information in parameter estimation, variance estimation in surveys with a complex sample design and non response estimation techniques and imputation techniques.

Statistical Quality Control - 18 hours

Topics in Applied Statistics – 18 hours

B) Computational Statistics

Bayesian Statistics – 18 hours
The basic principles of Bayesian Statistical and its applications are presented

Statistical Learning – 18 hours
This course is about extracting information from data using statistical models. It includes a variety of methods for data clustering, observation classification as well as the necessary theoretical background to be able to evaluate the process and the extracted information.

Statistics for Big Data – 18 hours
The course deals with the differentiations, challenges and alterations of known statistical methods in modern problems with a large amount of data but also with unstructured data. The lectures present

these changes as well as methods for network data, problems such as multiplicity, regression for large-scale data, regularization and other contemporary techniques.

Advanced Stochastic Processes – 18 hours
Principles of stochastic processes are presented. Among those introduced are martingales in discrete and continuous time, the Markov property, Poisson processes, the Brown movement, Ito's stochastic integral and its properties. Finally, the basic theory of stochastic differential equations is presented.

Topics in Computational Statistic – 18 hours

Γ) Stochastics

Probability Theory – 18 hours
The general framework of Probability theory is presented, emphasizing on the kinds of stochastic convergence, corresponding limit theorems and the general form of probability measures in the actual Borel conjecture**.**

Time Series Analysis – 18 hours
Basic theory of time series analysis, AR, MA, ARMA models as well as parametric and non parametric decomposition of time series components and its applications.

Stochastic Models in Finance – 18 hours
This course introduces the theory of some important stochastic models in finance, like the Black-Scholes model, as well as other models for pricing financial products. It also introduces the necessary theory of stochastic differential equations for researching these models.

Financial Econometrics – 18 hours

Topics in Stochastics – 18 hours