

Review Course in Math and Statistics 2011 – 2012 Edition

Teachers

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Course Outline

1. Probability and Statistics (T. Cajner)

Part 1: Introduction to probability

- a. probability and counting rules
- b. conditional probability, independence
- c. Bayes theorem
- d. probability distributions

Part 2: Random variables

- a. discrete random variables
- b. cumulative distribution function
- c. expectation of a random variable, variance
- d. sums and averages of i.i.d random variables
- e. discrete models
- f. continuous random variables, probability density
- g. continuous models: gaussian, chi-squared, t and F distributions
- h. moments of a random variable, moment generating function
- i. central limit theorem
- j. other continuous models

Part 3: Basics of inference

- a. sampling distributions
- b. point estimation
- c. confidence intervals
- d. hypothesis testing
- e. non parametric tests
- f. power of a test

Part 4: Joint distributions

- a. joint, marginal and conditional distributions
- b. conditional moments, iterated expectation
- c. covariance and correlation
- d. the continuous case
- e. the multivariate normal
- f. linear combinations of normals

Part 5: Inference revisited

- a. simple regression model, analysis of variance
- b. properties of estimators
- c. maximum likelihood estimation

2. LP and Otimization (Daniel Serra)

Objective of the course: to introduce the students to mathematical and analytical tools to be used when solving business decision problems related to production and operations, marketing, finance and other business related areas

1. The art of quantitative modelling: the scientific approach
2. Excel tools for modelling
3. Linear programming I: Model building.
4. Linear programming II: the graphical system. Using the “solver” module in excel
5. Cases in business decision making