

## Content

| Course Code | Course Name                | Semester | Theory | Practice | Lab | Credit | ECTS |
|-------------|----------------------------|----------|--------|----------|-----|--------|------|
| ECON208     | Mathematical Statistics II | 4        | 4      | 0        | 0   | 4      | 6    |

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| Prerequisites          | ECON207 |
| Admission Requirements | ECON207 |

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| Language of Instruction | French  |
| Course Type             | Compulsory  |
| Course Level            | Bachelor Degree   |
| Objective               | The course is an introduction to the theoretical foundations of modeling and estimation methods used in many statistical applications. It provides essential mathematical perspective and tools and underlines the role of mathematics in applied statistics.   |
| Content                 | <p>Introduction: Modelisation of random events</p> <p>Part I: Special probability distributions</p> <p>Discrete distributions (uniform, bernoulli, binomial, geometric, hypergeometric, negative binomial, poisson)</p> <p>Continuous distributions (uniform, exponential, gamma, chi-square, beta, normal)</p> <p>Part II: Moments</p> <p>Central and non-central moments</p> <p>Moment generating functions</p> <p>Part III: Estimation and inference</p> <p>Sampling, Law of Large Numbers and Central Limit Theorem</p> <p>Point estimation (method of moments and maximum likelihood estimation)</p> <p>Sampling distribution of estimators</p> <p>Confidence intervals</p> <p>Hypothesis testing</p> <p>Part IV: Simple linear regression</p> <p>Ordinary least square estimation of parameters</p> |
| References              | <ol style="list-style-type: none"> <li>Schay, G. (2007), Introduction to Probability with Statistical Application, Birkhauser Boston.</li> <li>Sheldon, Ross (2004), Introduction to Probability and Statistics for Engineers and Scientists, Third Edition, Elsevier Academic Press.</li> <li>Fourastie J. et Laslier J.F (1987), Probabilites et Statistiques, Dunod-Paris.</li> <li>Grais, B. (1994), Methodes Statistiques: Tome 2, Dunod, Paris.</li> </ol>  |

## Theory Topics

| Week | Weekly Contents |
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