



# Master 2

## Statistics & Econometrics

### Directors :

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### COURSE OBJECTIVES

The Master 2 in Statistics and Econometrics is open to students who have already acquired a solid grounding in economics and / or mathematical statistics. It consists of general classes in mathematical statistics and econometrics and specialised classes in various fields of application. The objective of the course is firstly to provide students with a solid culture in the major areas of applied statistics. Acquiring this culture clearly has to go hand-in-hand with learning how to handle various software applications, with a particular focus on SAS, R and Matlab. Students will also acquire IT skills in database management. Options are available to help them gain a further insight into applications in a number of fields, not least the tertiary sector.

This course is intended to lead to careers in statistical studies, actuarial studies, quantitative analysis and biostatistics. Graduates tend to pursue a career in the banking and insurance industries, marketing, service companies and research consultancies.

### HIGHLIGHTS OF THE PROGRAMME

- One of the strengths of this course is that it has been designed to develop high level skills in both statistics and economics, thanks to TSE thematic research groups including in Mathematics of decision making and Statistics, Econometrics and Empirical Economics, etc.
- Teaching is very closely based on real business needs and students are operational immediately. Furthermore, classes in the many available options are taught by business professionals.
- Varied partnerships (for teaching, work experience and advice) have been put in place with numerous companies: Airbus, Air France, Avisia, Axa, BNP Paribas, BVA, Crédit Agricole, Inbox, L'Oréal and Micropole for example.
- The 'Statistic Consultancy' workshop (business consultancy projects carried out in small groups) helps students get ready to join the labour market.

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### COURSE STRUCTURE

#### Statistics – Compulsory courses

1 <sup>st</sup> semester	2 <sup>nd</sup> semester
- Data Mining (16h + 10h)	-Big Data (30h)
- Survey sampling (21h) - Time series (12h + 12h)	-Scoring (30h)
-Statistical Softwares: SAS, R, Python and Excel (43,5h)	-Statistical Consulting (30h)
- Language : English or French as Foreign Language (FLE)(30h)	-Internship or master thesis
- Professionnal Development (12h)	

#### Statistics – Electives

1 <sup>st</sup> semester	2 <sup>nd</sup> semester
<b>2 options among :</b> ➤ <b>Option 1 :</b> - Lifetime data analysis (21h) - Panel data analysis (21h) ➤ <b>Option 2 :</b> - Econometrics of qualitative variables (21h) - Econometrics of Marketing (21h) ➤ <b>Option3:</b> - -Non-parametric models (21h) - -Outlier detection and extreme value theory (21h)	<b>2 options among :</b> <b>Option 1:</b> - Complex Structure Data Analysis (21h+21h) <b>Option 2:</b> - Spatial econometrics (21h) - Geomarketing (21h) <b>Option 3 :</b> - Data bases (21h) - Web Mining (21h)

#### Non mandatory course:

- Datanomics: regulation of data spreading and data protection (15h)

In addition, students may attend at the beginning of the academic year optional refresher courses in mathematics:

- A refresher course in algebra
- A refresher course in probability
- A refresher in Dynamic optimization

The university year is divided into two semesters. To obtain the Master in Statistics and Econometrics, students must pass *statistics compulsory courses* and the *statistics electives*. For the *statistics compulsory courses*, students must pass all 8 modules. For the statistics electives, students must pass 4 modules. In addition, students must undertake a compulsory internship for a period of at least 4 months, from April onwards, with a viva in September or write a master thesis. All the classes are taught in English.

#### ENTRY REQUIREMENTS

- A 1<sup>st</sup> year master's in economics and statistics or economics or a 1<sup>st</sup> year master's in applied mathematics.
- For overseas students, a BSc, an MA or an MSc obtained from a reputable institution, deemed compatible with the course and approved by the TSE Council. A good command of English is also required.

#### - Prerequisites

Subjects to be revised as a matter of priority before the start of the university year are as follows:

- Statistics: univariate and bivariate analysis, linear model and Gaussian linear model, regression and factorial plan applications and asymptotic tests (Wald, score and LR).
- Data analysis: principal component analysis
- Optimization: Lagrange multipliers
- IT: statistical software or spreadsheets

#### SELECTION CRITERIA

Selection is based on academic excellence and review of the full application by the Admissions Committee.

#### APPLICATIONS

- For students holding a French qualification:

Application forms may be collected and returned completed between in May.

- Overseas students:

Application forms may be collected in November (Eiffel scholarship applicants) and in February.

#### FURTHER INFORMATION

Masters Office - TSE  
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