

Program 2020-2021

Toulouse School of Economics offers a **two-year Master's program** in Economics that integrates different options in the first year that prepare to the different specializations offered in the second year. Within the international track in econometrics and statistics, students can choose to pursue in the Statistics and Econometrics international master or the Economic Theory and Econometrics Doctoral master. All courses are taught in English and students benefit from specific courses and services to help them learn, grow and build skills in a challenging international job market.

1st year: Master in Econometrics and Statistics

Objective

The key objective of this master program is to give students a broad and solid classical education in economics together with a very good level in applied mathematics. 100% of courses of this program are taught in English. The program is composed of two exclusive paths: the “**Applied Statistics and Econometrics**” path, and the “**Decision mathematics**” path.

Applied econometrics and Statistics path: students are prepared for executive-level jobs in the service sector (quantitative marketing, banking, industry, etc.). The combination of economics and mathematical engineering is what makes this track unique at TSE. The natural continuation is the master 2 “Statistics and Econometrics”. Career options include data scientist, consultant in statistics or econometrics, statistical engineer.

Decision mathematics path: students acquire a good level in classical quantitative economics as well as in the fields of applied mathematics related to economics (game theory, advanced analysis, optimization). After the first year, it is possible to continue at TSE within the International track master 2 in Statistics and Econometrics or within the Doctoral track Master 2 “Economic Theory and Econometrics”, or outside TSE in a master 2 in applied mathematics. In this latter case, examples of trainings followed by former students include master 2 in Data Science at ENSAE, master 2 in applied mathematics at Paris-Dauphine, master 2 in Operational research at university Toulouse III, PhD student at Ecole Polytechnique, etc.

A. Applied Econometrics and Statistics path

Courses:

SEMESTRE 1	SEMESTRE 2
<p>Compulsory courses:</p> <ul style="list-style-type: none"> • Applied econometrics • Intermediate econometrics * • Mathematical Statistics 1 * • Game Theory * • Statistical Softwares for data scientists (SAS, R, Python) • Professional Development • FLE 	<p>Compulsory courses:</p> <ul style="list-style-type: none"> • Program Evaluation* • Applied econometrics* • Mathematical Statistic 2* • FLE
<p>2 electives from:</p> <ul style="list-style-type: none"> • Environmental economics • Economic History • Markov chain and applications++ • Probability Modelling • Evolution of economic behaviour • Understanding real world Organizations • Project management • Optimization 	<p>4 electives from:</p> <ul style="list-style-type: none"> • Time series** • Introduction to big data **+ (limited numbers of students) • Martingales theory and application++ • Data Bases ** • Optimization for big data**+ (limited numbers of students) • Industrial Organization** • Corporate finance** • Economics of Human Development** • Environmental & Resource Economics** • Market finance** • Dynamic Optimization
<p>End of August refresher courses - Math Camp:</p> <ul style="list-style-type: none"> • Algebra Refresher *** • Probability refresher *** • Static Optimization refresher *** 	<p>Internship or master thesis</p>

* Core Courses

** Highly suggested by a M2 director:

- 'Introduction to big data' or 'Optimization for big data' or 'Data bases' or 'Times series': M2 Statistics and Econometrics
- Industrial Organization: M2 EMO
- Environmental & Resource Economics: M2 ERNA
- Economics of human development: M2 PPD
- Corporate Finance et Market Finance: M2 Finance
- Time Series: M2 EEE

*** Math camp for M1 and M2 students

+ Introduction to big data et Optimization for big data are opened to the 1st 45 registered students

++Student must have followed the course "Markov chains"

B. Decision Mathematics path

Courses:

SEMESTRE 1	SEMESTRE 2
<p>Compulsory courses:</p> <ul style="list-style-type: none"> • Macroeconomics* • Intermediate econometrics* • Mathematical Statistics 1* • Strategic Optimization* • Advanced Analysis* • Professional Development • FLE 	<p>Compulsory courses:</p> <ul style="list-style-type: none"> • Program Evaluation* • Games and Equilibria* • Mathematical Statistics 2* • FLE
<p>Optional:</p> <p>1 among 2:</p> <ul style="list-style-type: none"> • Markov Chains and applications++ • Optimization <p>1 among 7 (at least one course **):</p> <ul style="list-style-type: none"> • Markov Chains and applications**++ • Optimization • Probability Modeling • Environmental Economics • Economic History • Evolution of economic behaviour • Project Management 	<p>Optional:</p> <p>1 among 2</p> <ul style="list-style-type: none"> • Martingales theory and applications++ • Optimization for big data**++ <p>3 among 12 (at least one course **):</p> <ul style="list-style-type: none"> • Martingales theory and applications++ • Optimization for big data**+ • Introduction to big data+ • Advanced Macroeconomics • Advanced Microeconomics • Time series** • Industrial Organization** • Corporate finance** • Market finance** • Dynamic optimization • Environmental & Resource Economics** • Economics of Human Development**
<p>End of August refresher courses – Math Camp:</p> <ul style="list-style-type: none"> • Algebra refresher *** • Probability refresher *** • Static Optimization refresher *** 	<p>Internship or master thesis</p>

* Core courses

** Masters 2 Directors recommend to attend some options:

- Introduction to Big Data or Optimization for Big Data or Data Bases or Time Series: M2 Stateco
- Industrial Organization: M2 EMO
- Environmental & Resource Economics : M2 ERNA
- Economics of human development: M2 PPD
- Corporate Finance et Market Finance: M2 Finance
- Time Series: M2 EEE

*** Mathematics refresher courses, for TSE M1 and M2 students

+ Introduction to big data and Optimization for big data courses are opened to the first 45 registered students (on the come first/first served basis).

++ The Martingales theory course (UE4) is opened only to students who have attended the Markov chains option (UE3).

2nd year: Master in Econometrics and Statistics

2nd year Masters

1. Master in Statistics and Econometrics

SEMESTRE 1	SEMESTRE 2
<ul style="list-style-type: none"> • Data Mining • Survey sampling • Time series • Statistical Consulting • Statistical Software: SAS, R, Python and Excel • FLE (only for foreign students) • English (only for French speaking students) • Professional development 	<ul style="list-style-type: none"> • Statistical Consulting • Big Data • Scoring • English (only for French speaking students) • Internship or master thesis
<p>Electives (2 among 4):</p> <p><u>Option 1:</u></p> <ul style="list-style-type: none"> • Lifetime data analysis • Panel data analysis <p><u>Option 2:</u></p> <ul style="list-style-type: none"> • Econometrics of qualitative variables • Econometrics of Marketing <p><u>Option 3:</u></p> <ul style="list-style-type: none"> • Non-parametric models • Outlier detection and extreme value theory <p><u>Option 4:</u></p> <ul style="list-style-type: none"> • Mathematics of machine and deep learning algorithms part 1 • Mathematics of machine and deep learning algorithms part 2 <p>Non-Mandatory:</p> <ul style="list-style-type: none"> • Professional Development • Algebra Refresher • Probability Refresher • Dynamic Refresher • Datanomics : regulation of data spreading and data protection 	<p>Electives (2 among 4):</p> <p><u>Option 1:</u></p> <ul style="list-style-type: none"> • Graph theory • Graph analytics <p><u>Option 2:</u></p> <ul style="list-style-type: none"> • Spatial econometrics • Geomarketing <p><u>Option 3:</u></p> <ul style="list-style-type: none"> • Data bases • Web Mining <p><u>Option 4:</u></p> <ul style="list-style-type: none"> • To be announced

2. Master in Economic Theory and Econometrics (Doctoral path)

SEMESTRE 1	SEMESTRE 2
<p>Compulsory:</p> <ul style="list-style-type: none"> • Microeconomics 1 • Macroeconomics 1 • Econometrics 1 	<p>Compulsory:</p> <ul style="list-style-type: none"> • Microeconomics 2 • Macroeconomics 2 • Econometrics 2
<p>Choose 1 elective:</p> <ul style="list-style-type: none"> • Optimization • Game Theory 	<p>2 among 12:</p> <ul style="list-style-type: none"> • Asset pricing and financial market • Corporate finance and financial intermediation • Public economics of the environment • Development microeconomics • Public economics • Economic theory • Stochastic optimal control in economics • Topics in econometrics and empirical economics • Industrial Organization • Quantitative techniques in economics • Advanced Behavioral and Experimental Economics
	Master thesis

Acceptance criteria and enrollment

- Students with an undergraduate degree who majored in Economics or Economics and Mathematics at the Toulouse School of Economics TSE and able to justify a good English level (TOEFL, IELTS or Cambridge English Advanced Certificate C1 level required) are eligible to enroll in the M1 Econometrics and Statistics program international track (entirely taught in English)
- Or by application review:
 - Students with an undergraduate degree in an economic or mathematics field;
 - French or foreign students with a degree and credits considered equivalent, and able to justify a good English (TOEFL, IELTS or Cambridge English Advanced Certificate C1 level required) and Mathematics Level (GRE required for foreign students).

Application Process

Applications are considered in November for Eiffel scholarships applicants, in January for other foreign degree holders and in May for French degree holders : www.tse-fr.eu/admissions

Information

- **Administration:**

Building A – 1st floor

Université Toulouse 1 Capitole

Manufacture des Tabacs

31042 Toulouse cedex

Tel: +33 (0)5 61 12 86 54

Website: www.tse-fr.eu

Email: scoltsem1@ut-capitole.fr

Admission Office: TSE-studentsrecruitment@ut-capitole.fr

- **Programs:**

- Master in Economics and Statistics: Christine Thomas christine.thomas@tse-fr.eu