

## Master 2nd year – Apprenticeship contract

Program 2026/2027



### DEGREE

Master - (Level 7 of the European Nomenclature)  
RNCP Code: 39013

### OBJECTIVES

The second year of the Master's program emphasizes advanced and applied techniques in data science, statistics and econometrics. It offers in-depth courses in data science, including mathematics of machine and deep learning algorithms, optimization for deep learning, data mining, big data, regulation of data spreading and data protection. The program also includes applying statistics to the social sciences, such as spatial econometrics, graph analysis, survey sampling, scoring, extreme risk analysis and web mining.

In addition, the second year provides advanced training in large-scale database management and statistical software, including R, Python and Julia. These courses enable students to develop versatile skills in processing complex data (survey, graph and spatial data) using modern parametric, non-parametric, and machine learning methods.

This international track aims to train data scientists, data analysts, project managers, engineers and/or consultants with strong expertise in statistics and backgrounds in economics and econometrics. Graduates benefit from strong employability and can pursue careers in the tertiary sector (e.g. quantitative marketing, banking, insurance) as well as in industry and academic research.

### ORGANISATION

The program consists of 467 hours (including exams and tutorial support) and is delivered over a 12-month period from September (year n) to September (year n+1).

The timetable for apprentices is organized as follows: from September to March, apprentices spend three days per week at the university (Monday to Wednesday) and 2 two days in the company (Thursday and Friday). From April to August, they mainly work in the company.

The UT Handicap Service provides guidance, advise and support to students with disabilities throughout their university studies. <https://www.ut-capitole.fr/handicap>.

### TARGET AUDIENCE AND ELIGIBILITY CRITERIA

Selective program (*20 apprentices maximum*)

Admission requirements:

- Students who have completed the M1 program "Data Science for Social Sciences" are eligible to enroll in the M2 program.
- Alternatively, admission may be granted based on application review for:
  - Holders of a Master's degree in economics or mathematics;
  - Students holding French or foreign degrees or credits deemed equivalent, who can demonstrate a good level of English (TOEFL, IELTS or Cambridge English Advanced - C1 level required) as well as a strong background in mathematics (GRE required for international applicants).

More details are available online at: <https://www.tse-fr.eu/admissions>

## PROGRAM

M2 Data Science for Social Sciences	
UE1 Mathematics of Machine and Deep Learning Algorithms – 36h	UE11 Communication Skills or French as a Foreign Language (FLE) – 30h
UE2 Optimization for deep learning – 18h	UE12 Algebra refresher (optional) – 15h
UE3 Data Mining – 18h	UE13 Probability refresher (optional) – 15h
UE4 High Dimensional Statistics and Econometrics – 12h	UE14 Dynamic Optimization refresher (optional) – 15h
UE5 Scoring – 36h	UE15 Topics in Big Data and AI – 39h
UE6 Advanced Software for Data science – 43h	Big Data Management with AI and Cloud Computing – 12h
Julia – 23h	Advanced Topics in AI – 15h
R – 10h,	Behavioral Science for the Ethics of AI – 12h
Python – 10h	UE16 Spatial Econometrics – 18h
UE7 Non Parametric Models – 26h	UE17 Data bases – 26h
UE8 Survey Sampling – 26h	UE18 Web mining – 26h
UE9 Datanomics: regulation of data spreading and data protection (optional) – 15h	UE19 Graph analysis – 18h
UE10 Professional Development (optional) – 12h	UE20 Extreme Risk Analysis – 18h
	UE21 Activity report

**Total program duration: 467 hours, including 390 hours of teaching, 47 hours of project work, and 30 hours of exams.**

## ASSESSMENT AND EVALUATION PROCEDURES

The assessment criteria are provided at the beginning of the course and outline the methods of evaluation for obtaining the National Diploma: Master mention Econometrics, Statistics, Data Science for Social Sciences.

The program includes final exams and project work.

This training program does not offer partial validation by skills blocks. The certification is awarded only upon completion of the full training pathway.

## TEACHING METHODS AND RESOURCES

Training sessions are held in a dedicated classroom equipped with a video projector and internet access. A computer lab is available for training when required. Students also have access to a range of university resources, including computer labs, documentation centers, university libraries, and the Learning Center...

## CAREER/JOBS

The program of the international track Data Science for Social Sciences provides a wide range of career opportunities, including data scientists, data analysts, data miners, project managers, research engineers, and consultants in statistics. Graduates benefit from strong employability and can work not only in the tertiary sector, but also in industry and academic research. Key sectors include banking, insurance, marketing departments, service companies, startups, major tech companies, consulting firms, research laboratories, government statistical services (ministries, hospitals, etc.), and pharmaceuticals, to name a few. Based on a study of alumni career paths, the following is a non-exhaustive list of positions held by graduates of the M2 Statistics & Econometrics:

- Data Scientist, at BNP Paribas, Crédit Agricole, Saint-Gaubin, Continental, and Quantmetry
- Inspector, for the Société Générale
- Data Mining researcher, for GALEC
- Statistical economist, for the French Airports Association
- Junior Consultant, for the ESTIA group

## SKILLS

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The international track Data Science for Social Sciences enables students to acquire versatile skills in analyzing complex data, including panel, survey, survival, graph, and spatial data, using modern parametric, non-parametric, and statistical learning methods.

Another objective of the program is to provide students with a solid foundation in the methods and practices of data science, statistics, and econometrics, as well as a deep understanding of theoretical foundations and assumptions, along with the ability to interpret complex statistical results. Students develop consulting, teamwork, communication, and business skills, alongside expertise in computing and database management.

## PEDAGOGICAL TEAM

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**Program Directors:** Edouard Pauwels and Anne M. Ruiz, Professors, TSE

**University Professors and Senior Researchers** (indicative list):

Jérôme Bolte, Abdelaati Daouia, Eric Gautier, Edouard Pauwels, Anne M. Ruiz, Gilles Stupfler, Lynda Tamine Lechani, Christine Thomas-Agnan.

**Associate professors and junior chair** (indicative list):

Ondine Aza, Marion Hoffman.

**Professionals** (indicative list):

Sylvia Gil-Casals, Alejandro Lara, Louis Olive.

**Other faculty staff** (indicative list):

Colombe Becquart, Valentin Guillet, Jennifer Harpur, Isabelle Kawa Topor, Thibault Laurent, Camille Mondon, Rémi Perrichon.

## RATES – Academic year 2026-2027

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Apprenticeship contract fees: 10 000€ - private / public sector

Financial terms (private sector):

The training is funded by the company and the OPCO, up to the coverage level defined by the relevant industry sector. Any remaining balance is covered by the company.

The company is required to pay a mandatory fixed contribution of €750 (Decree No. 2025-585 of 27 June 25).

Midisup' is our partner for the deployment of apprenticeships, for the Master 2 Econometrics, Statistics International Track Data Science for Social Sciences.



### CONTACTS

#### ADMINISTRATION SCHOOL MASTERS 2, TOULOUSE SCHOOL OF ECONOMICS (TSE)

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Website : [www.tse-fr.eu](http://www.tse-fr.eu)

#### ADMISSIONS

E-mail : [admissions@tse-fr.eu](mailto:admissions@tse-fr.eu)

#### APPRENTICESHIP INFORMATION

E-mail : [pro-education@tse-fr.eu](mailto:pro-education@tse-fr.eu)