Toulouse School of Economics

Master Econometrics, Statistics
Data Science for Social Sciences

Master 2nd year – Apprenticeship contract

Program 2025/2026

DIPLÔME NATIONAL DE MASTER CONTRÔLÉ PAR L'ÉTAT

DEGREE

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

OBJECTIVES

The second year of this master emphasizes advanced and applied techniques in data science, statistics and econometrics. It offers deeper courses in data science, particularly in mathematics of machine and deep learning algorithms, optimization for deep learning, data mining, big data, regulation of data spreading and data protection, as well as specialized courses in different fields of application of statistics to social sciences, such as spatial econometrics, graph analysis, survey sampling, scoring, extreme risk analysis and web mining. Moreover, this second year of the program offers higher level courses of massive databases management and statistical software, namely R, Python and Julia. The different courses allow students to acquire versatile skills in the processing of complex data (survey, graph and spatial) with modern parametric, non-parametric, and learning statistical methods.

This international track aims to train "data scientists", "data analysts", "project managers", "engineers" and/or "consultants" in statistics with backgrounds in economics and econometrics. The graduates benefit from direct professional integration not only in the tertiary sector (e.g. quantitative marketing, banking, insurance), but also in industry and academic research.

ORGANISATION

The program represents a volume of 464 hours (including exams and support) spread over 12 months from September n to September n+1.
The timetable of the apprentice students is arranged as follows: From September to March, apprentices spend 3 days at the university (M-T-W) and 2 days in the company (Th-F). From April to August, they mainly work in the company.
The UT Handicap service is there to welcome you, advise you and support you throughout your university studies. https://www.ut-capitole.fr/campus/practical-information/ut1-disabled-student-service/

TARGET AUDIENCE AND ELIGIBILITY CRITERIA

Limited enrolment training *(20 apprentices maximum)*

Acceptance criteria and enrollment:

- Students majored in the M1 program "Data Science for Social Sciences" are eligible to enroll in the M2 program.
- Or by application review:
  - Holders of a master's degree in an economics or mathematics field;
  - Students holding diplomas or credits, French or foreign, deemed equivalent, and able to certify a good English level (TOEFL, IELTS or Cambridge English Advanced Certificate C1 level required) as well as a good Mathematics Level (GRE required for foreign students).

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 UE2 Data Mining– 30h UE3 Scoring– 36h UE4 Advanced Software for Data science – 43h UE5 Non Parametric Models– 26h UE6 Survey Sampling– 26h UE7 Datanomics: regulation of data spreading and data protection (optional) – 15h UE8 Professional Development (optional) – 12h UE9 Communication or French as a Foreign Language (FLE) – 30h	UE10 Algebra refresher (optional) – 15h UE11 Probability refresher (optional) – 15h UE12 Dynamic Optimization refresher (optional) – 15h UE13 Big Data– 36h UE14 Spatial Econometrics– 18h UE15 Optimization for deep learning – 18h UE16 Data bases– 26h UE17 Web mining – 26h UE18 Graph analysis – 18h UE19 Extreme Risk Analysis– 18h

Overall length of training: 464 hours, including 387 hours of teaching + 47 hours of project work + 30 hours for exams

ASSESMENT AND EVALUATION PROCEDURES

The Terms of knowledge control are given at the beginning of the session, and they mention the evaluation methods for obtaining the National Diploma: Master mention Econometrics, Statistics, Data Science for Social Sciences.
The training is punctuated by continuous controls but also by final exams and projects.

TEACHING METHODS AND RESOURCES

The training sessions take place in a dedicated classroom equipped with a video projector and internet connection. A computer room is reserved for training as needed. Possible access to various University resources: access to computer rooms, documentation centers, University libraries, Learning Center …

CAREER/JOBS

The program of the international track Data Science for Social Sciences yields diverse career opportunities including "data scientists", "data analysts", "data miners", "project managers", "research engineers", and “consultants" in statistics. The graduates benefit from direct professional integration not only into the tertiary sector, but also into industry and academic research. Key sectors of activity are banking, insurance, marketing departments, service companies, startups, GAFA, consulting firms, research laboratories, government statistical services (ministries, hospitals....), and pharmaceuticals, to cite a few. Based on a study conducted on professional integration, here is a non-exhaustive list of jobs held by graduates of the last years 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

The international track Data Science for Social Sciences allows students to acquire versatile skills in the processing of complex data (panel, survey, survival, graph, spatial) with modern parametric, non-parametric, and statistical learning methods.
Another objective of this program is to provide students with a solid background knowledge of the cultural aspects and the available methods in data science, statistics, and econometrics, as well as a deep understanding of theoretical foundations and hypotheses paired with the ability to interpret complex statistical results. In particular, consulting abilities, teamwork, communication and business skills are to be acquired in conjunction with the computing and databases management skills.

PEDAGOGICAL TEAM

Program Directors: Abdelaati Daouia and Anne Ruiz-Gazen, Professors, TSE

University Professors and Senior Researchers (indicative list)**:**
Jérôme Bolte, Abdelaati Daouia, Eric Gautier, Edouard Pauwels, Anne Ruiz-Gazen, 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 2025-2026

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

Apprenticeship contract fees: 10 000€ - private / public sector
Coverage by the company and its OPCO for the private sector

CONTACTS

ADMINISTRATION SCHOOL MASTERS 2, TOULOUSE SCHOOL OF ECONOMICS (TSE)
1, Esplanade de l'Université - Toulouse
E-mail : study-m2@tse-fr.eu
Website : www.tse-fr.eu

ADMISSIONS
E-mail : admissions@tse-fr.eu

APPRENTICESHIP INFORMATION
E-mail : elodie.fontana@tse-fr.eu

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