

**Teaching plan - PhD programme in Economics, Statistics and Data Science (ECOSTATDATA)**

37° Cycle a.y. 2021/2022 and 2022/2023

Course	SSD	Hrs	Credits	Educational form*	Type of activity**	Mandatory/Chosen activity
<b>1° year</b>						
<u>Computational Statistics I</u>	SECS-S/01	15	1,875	lecture	curricular	mandatory/curriculum Economics
<u>Mathematics I</u>	SECS-S/06	16	2,000	lecture	curricular	mandatory/curriculum Economics
<u>Mathematics II</u>	SECS-S/06	18	2,250	lecture	curricular	mandatory/curriculum Economics
<u>Mathematics - Linear Algebra</u>	SECS-S/06	8	1,000	lecture	curricular	mandatory/curriculum Economics
<u>Mathematics III</u>	SECS-S/06	16	2,000	lecture	curricular	mandatory/curriculum Economics
<u>Mathematical Analysis I</u>	MAT/01	15	1,875	lecture	curricular	mandatory/curriculum Statistics
<u>Mathematical Analysis II</u>	MAT/01	15	1,875	lecture	curricular	mandatory/curriculum Statistics
<u>Mathematical Analysis III</u>	MAT/01	15	1,875	lecture	curricular	mandatory/curriculum Statistics
<u>Numerical Optimization</u>	MAT/01	12	1,500	lecture	curricular	mandatory/curriculum Statistics
<u>Econometrics I - The Linear Regression Model</u>	SECS-P/05	18	2,250	lecture	curricular	mandatory/curriculum Economics
<u>Econometrics II - Microeconometrics</u>	SECS-P/01	15	1,875	lecture	curricular	mandatory/curriculum Economics
<u>Econometrics III - Time Series</u>	SECS-P/05	16	2,000	lecture	cross-curricular	mandatory
<u>Microeconomics I - Consumption, Production and Market Forms</u>	SECS-P/01	15	1,875	lecture	curricular	mandatory/curriculum Economics
<u>Microeconomics II - Game Theory</u>	SECS-P/01	20	2,500	lecture	curricular	mandatory/curriculum Economics
<u>Microeconomics III - Contract Theory</u>	SECS-P/01	15	1,875	lecture	curricular	mandatory/curriculum Economics
<u>Microeconomics IV - Industrial Organization</u>	SECS-P/01	15	1,875	lecture	curricular	mandatory/curriculum Economics
<u>Probability I</u>	SECS-S/01	18	2,250	lecture	curricular	mandatory/curriculum Statistics
<u>Probability II</u>	SECS-S/01	12	1,500	lecture	curricular	mandatory/curriculum Statistics
<u>Stochastic Processes</u>	SECS-S/01	15	1,875	lecture	curricular	mandatory/curriculum Statistics
<u>R for Data Science</u>	SECS-S/01	16	2,000	lecture	curricular	mandatory/curriculum Statistics

<u>Statistical Inference I</u>	SECS-S/01	15	1,875	lecture	curricular	mandatory/curriculum Statistics
<u>Macroeconomics I</u>	SECS-P/01	18	2,250	lecture	curricular	mandatory/curriculum Economics
<u>Macroeconomics II</u>	SECS-P/01	12	1,500	lecture	curricular	mandatory/curriculum Economics
<u>Macroeconomics - Applications</u>	SECS-P/01	12	1,500	lecture	curricular	mandatory/curriculum Economics
<u>Macroeconomics III</u>	SECS-P/01	12	1,500	lecture	curricular	mandatory/curriculum Economics
<u>Computational Statistics II</u>	SECS-S/01	12	1,500	lecture	cross-curricular	mandatory
<u>Research Methods I</u>	SECS-P/01	15	1,875	lecture	curricular	mandatory/curriculum Economics
<u>Finance I - Empirical Corporate Finance</u>	SECS-P/11	15	1,875	lecture	curricular	chosen/curriculum Economics
<u>Finance II - Asset Pricing Theory</u>	SECS-S/06	15	1,875	lecture	curricular	chosen/curriculum Economics
<u>Finance III - Banking</u>	SECS-P/11	15	1,875	lecture	curricular	chosen/curriculum Economics
<u>Statistical Inference II</u>	SECS-S/01	15	1,875	lecture	curricular	mandatory/curriculum Statistics
<u>Statistical Inference III</u>	MAT/06	15	1,875	lecture	curricular	mandatory/curriculum Statistics
<u>Bayesian Statistics I</u>	SECS-S/01	18	2,250	lecture	curricular	mandatory/curriculum Statistics
<u>Bayesian Statistics II</u>	SECS-S/01	12	1,500	lecture	curricular	mandatory/curriculum Statistics
<u>Data Management</u>	ING-INF/05	15	1,875	lecture	curricular	mandatory/curriculum Statistics
<u>Statistical Learning I</u>	SECS-S/01	12	1,500	lecture	curricular	mandatory/curriculum Statistics
<u>Statistical Learning II</u>	SECS-S/01	16	2,000	lecture	curricular	mandatory/curriculum Statistics
<u>Statistical Learning III</u>	SECS-S/01	8	1,000	lecture	curricular	mandatory/curriculum Statistics
<u>Statistical Modelling I</u>	SECS-S/01	12	1,500	lecture	curricular	mandatory/curriculum Statistics
<u>Statistical Modelling II</u>	SECS-S/01	12	1,500	lecture	curricular	mandatory/curriculum Statistics
<u>Statistical Modelling III</u>	SECS-S/01	12	1,500	lecture	curricular	mandatory/curriculum Statistics
<u>Statistical Modelling IV</u>	SECS-S/03	12	1,500	lecture	curricular	mandatory/curriculum Statistics
<u>Econometrics I - The Linear Regression Model (tutorials)</u>	SECS-P/05	8	1,000	lecture	curricular	mandatory/curriculum Economics
<u>Econometrics II - Microeconometrics (tutorials)</u>	SECS-P/01	9	1,125	lecture	curricular	mandatory/curriculum Economics
<u>Econometrics III - Time Series (tutorials)</u>	SECS-P/05	12	1,500	lecture	cross-curricular	mandatory/curriculum Economics
<u>Microeconomics I - Consumption, Production and Market Forms (tutorials)</u>	SECS-P/01	7	0,875	lecture	curricular	mandatory/curriculum Economics
<u>Microeconomics II - Game Theory (tutorials)</u>	SECS-P/01	8	1,000	lecture	curricular	mandatory/curriculum Economics
<u>Microeconomics III - Contract Theory (tutorials)</u>	SECS-P/01	7	0,875	lecture	curricular	mandatory/curriculum Economics
<u>Microeconomics IV - Industrial Organization (tutorials)</u>	SECS-P/01	7	0,875	lecture	curricular	mandatory/curriculum Economics
<u>Research Methods II</u>	SECS-P/01	15	1,875	lecture	curricular	mandatory/curriculum Economics

<u>Strategy and Organization</u>	SECS-P/08	15	1,875	lecture	curricular	mandatory/curriculum Big Data & Analytics for Business
<u>Technology and Innovation Management</u>	SECS-P/08	15	1,875	lecture	curricular	mandatory/curriculum Big Data & Analytics for Business
<u>Economics and Organization</u>	SECS-P/01	15	1,875	lecture	curricular	mandatory/curriculum Big Data & Analytics for Business
<u>Industrial Economics</u>	SECS-P/01	15	1,875	lecture	curricular	mandatory/curriculum Big Data & Analytics for Business
<u>Probability</u>	SECS-S/01	15	1,875	lecture	curricular	mandatory/curriculum Big Data & Analytics for Business
<u>Statistical Inference (Classic and Bayesian)</u>	SECS-S/01	30	3,750	lecture	curricular	mandatory/curriculum Big Data & Analytics for Business
<u>Databases for Structured and Unstructured Data - SQL</u>	INF/01	15	1,875	lecture	curricular	mandatory/curriculum Big Data & Analytics for Business
<u>Programming in Python</u>	INF/01	15	1,875	lecture	curricular	mandatory/curriculum Big Data & Analytics for Business
<u>Data Quality and Cleaning for Big Data</u>	ING-INF/05	15	1,875	lecture	curricular	mandatory/curriculum Big Data & Analytics for Business
<u>Architecture for Big Data Processing</u>	INF/01	15	1,875	lecture	curricular	mandatory/curriculum Big Data & Analytics for Business
<u>Machine Learning</u>	SECS-S/01	15	1,875	lecture	curricular	mandatory/curriculum Big Data & Analytics for Business
<u>Big Data Processing Lab (Hadoop/Spark)</u>	INF/01	15	1,875	lecture	curricular	mandatory/curriculum Big Data & Analytics for Business
<u>Cloud &amp; Distributed Algorithms</u>	INF/01	15	1,875	lecture	curricular	mandatory/curriculum Big Data & Analytics for Business
<u>Data Mining</u>	INF/01	15	1,875	lecture	curricular	mandatory/curriculum Big Data & Analytics for Business
<u>Natural Language Processing</u>	INF/01	15	1,875	lecture	curricular	mandatory/curriculum Big Data & Analytics for Business
<u>Human-centered AI</u>	ING-INF/05	15	1,875	lecture	curricular	mandatory/curriculum Big Data & Analytics for Business
<b>2° year</b>						
<u>Spatial Models in Microeconomics</u>	SECS-P/01	15	1,875	lecture	curricular	chosen/curriculum Economics
<u>Financial Frictions</u>	SECS-P/01	15	1,875	lecture	curricular	chosen/curriculum Economics
<u>Unconventional Monetary Policy</u>	SECS-P/01	15	1,875	lecture	curricular	chosen/curriculum Economics
<u>Heterogeneous Agents Models</u>	SECS-P/01	15	1,875	lecture	curricular	chosen/curriculum Economics
<u>Inequality, Polarization and Mobility</u>	SECS-P/01	15	1,875	lecture	curricular	chosen/curriculum Economics
<u>Economic Forecasting</u>	SECS-P/05	15	1,875	lecture	curricular	chosen/curriculum Economics

<u>Empirical Banking</u>	SECS-P/11	15	1,875	lecture	curricular	chosen/curriculum Economics
<u>Advanced Asset Pricing and Portfolio Management</u>	SECS-P/01	15	1,875	lecture	curricular	chosen/curriculum Economics
<u>Advanced Corporate Finance</u>	SECS-P/07	15	1,875	lecture	curricular	chosen/curriculum Economics
<u>Some Issues in Statistical Modelling</u>	SECS-S/01	15	1,875	lecture	curricular	mandatory/curriculum Statistics
<u>Bayesian Non-parametric Mixed Models</u>	SECS-S/01	15	1,875	lecture	curricular	mandatory/curriculum Statistics
<u>Statistics for Spatio-Temporal Data</u>	SECS-S/01	15	1,875	lecture	curricular	mandatory/curriculum Statistics
<u>Automated Machine Learning &amp; Neural Architectural Design</u>	SECS-S/01	15	1,875	lecture	curricular	mandatory/curriculum Statistics
<u>Deep Learning</u>	INF/01	15	1,875	lecture	curricular	mandatory/curriculum Statistics
<u>Social Media Analytics</u>	INF/01	8	1,000	lecture	curricular	mandatory/curriculum Big Data & Analytics for Business
<u>Natural Language Understanding</u>	INF/01	8	1,000	lecture	curricular	mandatory/curriculum Big Data & Analytics for Business
<u>Semantic Web</u>	ING-INF/05	8	1,000	lecture	curricular	mandatory/curriculum Big Data & Analytics for Business
<u>eXplainable AI for Business Value</u>	INF/01	8	1,000	lecture	curricular	mandatory/curriculum Big Data & Analytics for Business
<u>Deep Learning and Computer Vision for Business</u>	INF/01	8	1,000	lecture	curricular	mandatory/curriculum Big Data & Analytics for Business
<u>Data Visualization &amp; Visual Analytics</u>	INF/01	8	1,000	lecture	curricular	mandatory/curriculum Big Data & Analytics for Business
<b>Total hrs/credits</b>		<b>1191,00</b>	<b>148,88</b>			

**Educational form\***

lecture  
laboratory training  
seminar

**Type of activity\*\***

curricular  
cross-curricular