Bachelor's Degree
Social Sciences and Law

Applied Data Science

Syllabus

TYPE OF SUBJECT	ECTS
Core Studies	60
Compulsory	144
Elective *	24
Bachelor Thesis	12
Total	**240**

* Includes Internships.

YEAR ONE	ECTS
Data Science Core Components	6
Digital Economics	6
Exploratory Data Analysis	6
Mathematical Methods for Data Science I	6
Mathematical Methods for Data Science II	6
Parametric Inference	6
Probability Theory	6
Programming I	6
Programming II	6
Statistical Software I	6

YEAR TWO	ECTS
Databases	6
Discrete Mathematics for Data Science	6
Mathematical Methods for Data Science III	6
Nonparametric Inference	6
Programming for Analysis and Data Science	6
Socioeconomic Indicators and Open Data	6
Statistical Software II	6
Study and Data Debugging	6
Supervised Learning I	6
Time Series	6

YEAR THREE	ECTS
Data Science and Health	6
Databases NoSQL	6
Econometrics for Data Science	6
Non-Supervised Learning	6
Social Network Analysis	6
Spatial Data Analysis	6
Supervised Learning II	6
Supervised Learning III	6
Elective Subject	6
Elective Subject	6

YEAR FOUR	ECTS
Big Data: Distributed and Parallel Processing	6
Customer Data Analysis	6
Risk Management and Scoring	6
Text Mining	6
Unstructured Data Analysis I	6
Unstructured Data Analysis II	6
Elective Subject	6
Elective Subject	6
Bachelor Thesis	12

ELECTIVE SUBJECTS	ECTS
Applications of Advanced Modelling	6
Bayesian Data Analysis	6
Business Intelligence and Firms' Strategy	6
Data Analysis in Insurance Science	6
Data Science Applications for Social Networks and Sociopolitical Phenomena	6
Data Science Applied to Biology	6
Geographic Information Systems for Data Science	6
Library, Data and Scientific Information	6
Personal Data Protection Applied to Data Science	6
Simulation in Data Science	6
External Internships	6

PARTICIPATION CREDITS	ECTS
Any course	6

Knowledge acquired

- Use of basic algebra, calculus and numerical analysis techniques and tools to solve problems in the field of Data Science.
- Identification and selection of the main sources of information and indicators in different fields of application.
- Methodology to solve real problems: identify the information, design the study, analyse the data, build an adequate model, interpret the results and issue technical reports.
- Identification of the usefulness and potential of statistical and data analysis techniques acquired in different application areas. Appropriate use of those techniques to discover behavioural patterns in data of any volume and typology and to draw relevant conclusions.
- Estimation, diagnosis, comparison and validation of models in different problems of inference and prediction on study populations.
- Statistical and machine learning techniques in the analysis of qualitative and quantitative data of any volume and type, such as spatial, text, images, etc.
- Use of the necessary software tools to store, process and visualize data of any volume in different fields.
- Efficient storage and processing of structured and unstructured data of various types and volumes.
- Design, programming and implementation of data science and analysis of applications.
- Identification and application of techniques for information extraction, preparation and debugging of available information for subsequent data analysis.
- Techniques and tools for the prediction and quantification of the relationship between variables in different fields of application.
- Identification and application of basic and advanced algorithmic techniques to find sequential and parallel solutions to problems, analysing the complexity and adequacy of the proposed algorithms according to the type, organization and volume of data.
- Identification and application of data analysis techniques for project management.

Professional opportunities

- Engineering: quality control, process control, reliability, logistics, pattern recognition.
- Bio-health sector: epidemiology, drug development, genomic data, etc.
- Business sector: market research, finance, insurance, job placement, product implementation, customer relations, auditing and consulting, etc.
- Areas related to environment and climate change, media, geography, demography, agriculture, food, sports, third sector, etc.
- All sectors and organizations: analysis, processing and interpretation of data and big data. Decision making based on data of any type and volume.
- Public administration, teaching and research.

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