



Executive Master in Big Data & Business Analytics

Course List and Descriptions

Data Driven Business Strategy

Professor: Louis David Benyayer

Credit hours: 20 hours - 5 ECTS

Pre-requisite: None

Data driven business strategy: using data strategically to sustain competitive advantage

“Data is the new oil”. When Nelly Kroes, former VP of the European commission responsible for the digital agenda, pronounced this speech, she expressed a commonly admitted idea that the emergence of big data constituted an important source of value creation. Since then, many reports and analysis have attempted to seize the value created by data. For example, McKinsey concluded that open data would create yearly value of 3 000 billions \$.

Where does that value come from? How corporations use data to generate value? How can data help build and sustain a competitive advantage?

This course will address these questions going through three typical forms of value of data. Beyond being a commodity, bought and sold, data has two other forms of value for corporations: data as a lever to improve the performance of the current business model and data as a strategic asset to get a better position in the competitive landscape or launch new business models.

Data Visualisation and Business Insights

Professor: Olivier Leroy

Credit hours: 20 hours - 5 ECTS

Pre-requisite: None

Data is omnipresent. The younger generations are very comfortable with its manipulation, but not always with its meaning. This module offers a mix of business and technical learnings, and is aimed at decision-makers who know their business and want to quickly understand a situation or a context via data thanks to visual representations.

Decision Making

Professor: Enes Eryarsoy

Credit hours: 20 hours - 5 ECTS

Pre-requisite: None

This course studies individual and collective decision-making, and the factors that affect the process. The course starts with describing the context and nomenclature in decision-making. The rest is organized under three main themes/sections: The first section deals with the individual-level factors influencing managerial decision-making. The second section of the course deals with group and organizational factors that collectively affect decision-making. The final section of the course aims at introducing some tools and techniques used in decision-making.

Marketing Analytics

Professor: Hsin-Hsuan Lee

Credit hours: 20 hours - 5 ECTS

Pre-requisite: None

Every marketing decision requires a solid basis of insights. While it may be true that insights can be extracted from experiences and intuitions, data and the information that comes with has become an increasingly prominent force that supports decision-making. Specifically in the context of marketing, the purpose of which has often been misleadingly viewed as a predominantly creative act. This course stresses the importance of considering an analytical dimension to it, which is essential to meaningfully connect the marketing function to strategic and hence long-term decisions of any organization.

To accomplish this task, we note that every marketing strategy needs to be assessed in terms of its productivity, often referred to as “performance” in marketing practice, that considers both effectiveness and efficiency. This is true even more so in times with ever decreasing marketing budgets. The possibilities to collect data—in particular from consumers, and increasingly through information technologies—are widespread and should support the planning and monitoring of any marketing activity.

Consequently, this course introduces students to the core concept of consumer-centric marketing and the main key performance indicators (KPIs) that act as the core planning and monitoring figures in assessing a marketing strategy.

Management Decision Modeling

Professor:: Wei Zhou

Credit hours: 20 hours - 5 ECTS

Pre-requisite: None

This course focuses on teaching the students the skills needed to apply decision models to different kinds of organizational decision-making situations. The discussions are very application oriented and software based, with a view toward how a manager can effectively apply the models learned to improve the decision-making process.

This course also covers some of the core decision modeling topics, including linear programming, network modeling, project management, decision analysis, and simulation. These topics have wide industry applications in supply chain management, production optimization, inventory management, flight and airport planning, etc.

Big Data Technologies

Professor: Axel Tifrani

Credit hours: 20 hours - 5 ECTS

Pre-requisite: None

Illustrates how data are produced and how they can be utilized in various areas of industry

Discusses current and emerging Big Data applications

The state-of-the-art big data architectures

The modern Big data architectures for Big Data processing and analytics.

AI/ML and Predictive Analytics

Professor: Akin Kazacki

Credit hours: 20 hours - 5 ECTS

Pre-requisite: None

This course provides an introduction to machine learning models for supervised learning. Supervised learning is a branch of machine learning that deals with using recorded labelled data in order to build models that can make predictions on unseen data. Supervised learning has vast business applications, such as detection of fraudulent financial transactions, prediction of a customer's willingness to pay, and prediction of a patient's likelihood of readmission to the hospital shortly after discharge. In this course, the focus is on building a deep conceptual understanding of the way in which different algorithms learn from data without going too much into the mathematical details. We will go through stylized examples, showing how different steps of an algorithm work, and also more thorough examples, where we analyse models that were built using real and synthetic data. We will learn how to evaluate different models, understand ways in which they might not perform well, and learn techniques for improving their performance.

Research Methods (Online course)

Professor: Micheal Haenlein

Credit hours: 15 hours - 4 ECTS

Pre-requisite: None

This course offers an introduction and overview of the fundamentals of research methods in the social sciences. Research methods refer to the set of tools that a researcher can use to design and execute a study to answer a research question. As an introductory course, this class will survey the range of processes that go into a research project. We will discuss quantitative and qualitative research designs and provide a brief review of epistemological issues and basic concepts of research design. As your research proceeds, you will undoubtedly find it necessary to delve more deeply into whichever methods are most relevant for your work. The course is intended to prepare participants for further study on specific methods.

Statistics for Managers

Professor: Howard Zhong

Credit hours: 20 hours - 5 ECTS

Pre-requisite: None

This course is to enable the students to comprehend the critical statistical concepts and know how to employ statistical analysis and modeling techniques to cope with emerging business problems. The emphasis of this course is on business applications rather than rigorous mathematics although math will be often used to illustrate the models.

Financial Analytics (elective course)

Professor: Chardin Wese Simens

Credit hours: 25 hours - 6 ECTS

Pre-requisite: None

This course focuses on the analysis of financial markets. It equips participants with the knowledge to analyze and interpret financial data to answer important questions such as: Are financial markets predictable? How can one compare different trading strategies? How do financial markets react to important news events?

The course is delivered over 10 hours and consists of 4 inter-connected sessions. In each session, we present the intuition behind the key financial concept(s), review the analytical tool(s), interpret the results and discuss their implications for financial market participants. The course draws on case studies from a range of financial markets as well as examples from the academic literature. In doing so, the class participants will be able to appreciate the usefulness of data analytics in the finance industry.

Supply Chain Management (elective course)

Professor: Richard Markoff

Credit hours: 25 hours - 6 ECTS

Pre-requisite: None

Supply chain management has become more important due to trends in globalization, consumer demand and ecommerce, leading to a deep repositioning of supply chains in strategic business decisions. This is in parallel with important technology advances such as Industry 4.0, Advanced Analytics and Machine Learning/Artificial Intelligence. This will allow supply chains to improve service and efficiency by syncing products as well as internal and external data with business decisions, but there are management challenges to chart a course to effectively exploit these new tools, particularly in post COVID world leading managers to consider supply chain resiliency.

Sustainability (Asynchronous)

Professor: Ramon Fisac

Credit hours: 20 hours - 5 ECTS

Pre-requisite: None

This course is an introduction to sustainability that combines knowledge about the main climate challenges and the application of solutions in the business context. The course utilizes asynchronous and synchronous learning with deployment of materials from The Climate School (15 hours). In the asynchronous part, the student will understand the science behind sustainability and discover the possible actions to face the challenge of climate change. In the synchronous part, the student will explore the application of sustainability to business and how to take into consideration ESG factors in business decision-making. This part is composed of 3-5 masterclasses that will cover the following topics: Sustainability management, Digital transition and sustainability, the world of data: challenges and risks, global value chains, and sustainable finance. Readings and some other asynchronous materials to prepare the masterclasses will support these topics.

A Group project features as a key part of the course (5 hours). Here, students will work in teams exploring different challenges related to the application of sustainability to business. A list of topics will be provided beforehand and the outcome will be a video recorded by the students explaining the analysis done in groups.

Data Security and Privacy

Professor: Yannick Meiller

Credit hours: 20 hours - 5 ECTS

Pre-requisite: None

The extraordinary capabilities of recent information technologies – in particular Big Data – when it comes to processing data can be applied to personal data. This is at the core of many current business models (the one of Google for instance). However this raises many questions, at the individual level as well as at the level of society. These questions are key for the future because they could lead to a change of stance from people as far as it concerns processing

their personal data. They are also key because they lead to the development of specific legal frameworks.

It is important to understand the structuring elements of this matter. This is the object of this unit.

To understand what is at stake when processing personal data.

To know the main elements of the legal framework of the European Union on personal data processing.

To be aware of the cultural biases

Data Leadership and Change

Professor: Guillaume Thfoin

Credit hours: 20 hours - 5 ECTS

Pre-requisite: None

According to a BCG study on achieving value from a data and analytics transformation, more than 85% of use cases fail to generate the promised value. The core reason for that failure is almost never the AI product itself. In fact, driving a successful transformation requires leadership in 4 core areas:

1. Data
2. Analytics and AI
3. Processes
4. People

Leaders that are expected to drive change in their organizations need to know enough about each of these topics to be able to navigate expertly through the many pitfalls that they may encounter.

This course will discuss these areas of leadership by leveraging a mix of theoretical content as well as many examples of local businesses that have led a data transformation.

Co-development Workshop

Professor: Maria Koutsovoulou

Credit hours: 20 hours - 5 ECTS

Pre-requisite: None

Inspired by action learning, co-development is an innovative methodology that allows you to improve your professional performance, personal reflexivity and self-awareness when faced with difficult/complex situations or decisions. Instead of diving alone into a complex problem or an unsolvable daily situation with little possibility of objectification, co-development offers you a more objective approach based on collective intelligence.

The method applies the principle of give and take between members of a group with similar professional experiences, backgrounds or concerns and relies on active listening.

The most relevant topics for co-development are those that do not require a binary answer or the application of a rational method or process. Managerial or other problems that refer to the human factor such as negotiation or conflict management, leadership, motivation of a person or a project team, issues related to communication, leading or implementing change, decision making in complex environments are some examples of relevant situations for co-development.

During the 20 hours dedicated to the practice of co-development, participants will be involved in a highly interactive workshop.

Prior to the co-development sessions that we will organize around the participants' current issues, we will work on topics related to communication and to the core mechanisms of individual and collective behavior in organizations.

International Consultancy Project

Professor: Maria Koutsovoulou

Credit hours: 20 hours - 5 ECTS

Pre-requisite: None

In groups, participants are expected to perform an in-depth analysis of a situation or a problem faced by a company and to define recommendations for actions that can realistically be implemented by the business.

This 6 month team project allows participants to use and consolidate their understanding of the concepts and tools taught during the programme. The outcome of the ICP is a series of recommendations that the sponsor company (corporate or start-up) can implement in order to meet the strategic challenge at hand.

The final report is graded by an academic jury. A presentation can be made publicly or privately according to the level of confidentiality required by the company sponsor.