Année universitaire 2024/2025

Big data and digital economy - 2ème année de master

Crédits ECTS : 60

LES OBJECTIFS DE LA FORMATION

Training future young international managers to the challenges of data intensive business models and organizational processes based on «machine learning» and «artificial intelligence». The program is dedicated to the acquisition of skills in digital management and strategies in the digital age. Targeted students are young graduates engineers, economists or lawyers wishing looking for a management expertise to participate to the development of their company with an organizational environment confronted with digital issues and data.

Skills acquired:

- Designing an effective data governance
- Building data visualization for business
- Leveraging the value of users (User generated Content and Customer as a resource)
- Designing a data driven business model
- Critical thinking about the potential and limit of Artificial Intelligence and algorithms

PRÉ-REQUIS OBLIGATOIRES

- Applicants must have a four-year bachelor degree from a good Chinese university; Non Chinese degree qualifications should be referred for assessment
- Applicants must be competent in the language of instruction (Mandarin and English), with B1 level
or equivalent English proficiency
- Applicants must hand in an essay about applying big data to decision science

PROGRAMME DE LA FORMATION

- Semester 3
  - Mandatory Courses
    - Introduction to Big Data
    - Data Governance
    - Big Data Analytical Methods
    - Marketing and data
    - Data visualization
    - Internet and Network economics
    - Strategic management and Data driven business models
    - Security Systems Audit and Big Data
- Semester 4
  - Mandatory Courses
    - Innovation Design Thinking
    - Big Data Case Studies

- Big data and research application
- Security, Regulation and Compliance
- Mémoire appliqué
- Stage appliqué

DESCRIPTION DE CHAQUE ENSEIGNEMENT

Big Data Analytical Methods

ECTS : 3

Description du contenu de l'enseignement :

- Understand the different approaches in Big Data.
- Machine learning methodologies.
- Deep learning methodologies.
- Big data implementation with software.

- This course brings students knowledge about the different methods and algorithms in machine learning and deep learning.

Compétence à acquérir :

- Being able to select the right methodology to tackle a business issue with data.
- Being able to use R software.
- Present a model and how to use it.

Big Data Case Studies

ECTS : 3

Description du contenu de l'enseignement :

- Understand the state of the art of Big Data Practices among various industries.
- Analyze corporate Big Data strategies.
- Propose new ways of exploiting data to enhance business development.
- Understand the variety of data available in various industry (automotive, aeronautics, mobility, bank, advertisement, etc.).
- Analyze real business cases.
- Make new proposition based upon new Big Data methodologies.

Compétence à acquérir :

- Advance knowledge in data processing in various industries.
- Solving real organizational challenges.

Big data and research application

ECTS : 3

Description du contenu de l'enseignement :

- Data gathering and cleaning, managing integrity and security.
- Database integration and Data sharing.
- Data analytics: how to build knowledge
- How to turn knowledge into economic value and business application.

- This course is an introduction to the processes relied upon by data scientists to turn the potential of the availability of data at a large scale into relevant knowledge to analyze socio-economic or psychological phenomena and turn them into value. The aim is not to train the audience in using these technics, but to make it familiar enough with them to discuss with data scientists and to be able to understand the potential and limits of knowledge resulting from big data.

Compétence à acquérir :

- Understanding of the constraints in gathering, cleaning and organizing data sets.
- Mastering the organizational requirements to manage data bases in a long term and business perspective.

- Critical thinking about the potential and limit of Artificial Intelligence and algorithms.
- Alternative analytical strategies to derive knowledge from big data.

Data Governance

ECTS : 3

Description du contenu de l'enseignement :

- Principles and methodology of data governance.
- Organizational and process management – data life cycle management.
- Technical aspects: master data management (MDM).
- Data Quality Management.
- Compliance and regulations indifferent economic zones (EU, USA).
- Health data and other specific data regulation.

- This course focuses on an organizational and technical approach of data management. Extracting value from data requires effective data management process. Value heavily relies on data quality. Research shows that data quality depends on both a technical approach and an organizational approach. Thus, designing the data governance is a key strategic issue for organizations in the Big Data era.

Compétence à acquérir :

- Designing an effective data governance.
- Organizing data management process.
- Managing Data quality in an organization.
- Building Master Data Management (MDM).
- Understand et comply with different data legal frameworks.

Data visualization

ECTS : 3

Description du contenu de l'enseignement :

- Principle and methodologies of data representation.
- Key Performance Indicators building and management.
- Analytical methods: visual data representation, visual dashboarding.
- Using data visualization software (Tableau Software).
- Alternative type of representation such as 3D representation.

- As organizations cope with more and more data, the question of how to represent them for decision maker is becoming a hot topic. Thanks to new type of methodologies and software, organizations can build data visualizations that are meaningful for managers. This course deals with topics such as data representation, building effective KPI, choosing the right tools and methodologies to represent large set of data.

Compétence à acquérir :

- Understand the challenges of data visualization in the Big Data era.
- Building effective visual dashboarding.
- Selecting the right methodology in data visualization.
- Building data visualization for business.

Innovation Design Thinking

ECTS : 6

Description du contenu de l'enseignement :

- Basics and study of examples of innovative products, services, processes and management methods.
- Theory C / K and innovation reasoning.
- Organization of innovation and innovative capabilities of companies.

- The aim of the course is to convey to students the contemporary theories and practices of innovation management in its upstream phase: innovative design reasoning and organization of the innovation function in the company.

Compétence à acquérir :

- Ability to generate concepts with potential for innovation, to identify and overcome fixation effects, to conduct structured reasoning in the unknown.
- Ability to analyze an organization and propose modifications to increase its innovative capabilities.

Internet and Network economics

ECTS : 6

Description du contenu de l'enseignement :

- Economics of information.
- Networks effects.
- Governance technologies.
- New business models.

- This course aims at teaching the fundamentals of the economics of the three pillars of the digital transformation. Digital technologies allow, first, to generate and market information goods at a very large scale. Second digital technologies are characterized by strong network effects that depends upon both interdependences among components and networks topology. Third digital technologies allow to substitute capital for labor in governance, changing its very nature and allowing radical innovations. The specificities of the marketing of information goods, of network effects and of digital governance explain pricing and competitive strategies in the digital era, as well as the essence of digital business models and their variations.

Compétence à acquérir :

- Principles behind the production, marketing and valuation of goods and services intensive in information and knowledge.
- Understanding of the interactions between socio-economic and technical phenomena in the Internet era.
- Understanding processes of organizational changes supported by digital technologies.
- Analytical methods to analyze and develop sustainable business models.

Introduction to Big Data

ECTS : 3

Description du contenu de l'enseignement :

- Datafication of the world and its consequence.
- Building knowledge and models from data.
- Historic approach of the field.
- Main approach in the field.
- Data, technical infrastructure, models.

- This opening course brings student an overview of the Big Data landscape from its origins to the most advanced actual uses. It helps students with a global framework to better understand why Big data takes place today in various business fields.

Compétence à acquérir :

- Have a global perspective on Big Data.
- Understand the Big data origins.
- Identify the main applications in business.
- Cope with various challenges in Big Data applications.

Marketing and data

ECTS : 3

Description du contenu de l'enseignement :

- Business Intelligence.
- Segmenting and targeting through social networks.
- Digital communication / Changes in the advertising industry.
- New regulation of private data on marketing activity.
- Getting knowledgeable to interact with internet digital companies.
- Developing innovative solutions.

Compétence à acquérir :

- Mastering the new marketing tools.

- Adjusting marketing strategies to private life respect.

Mémoire appliqué

ECTS : 9

Description du contenu de l'enseignement :

- A master's thesis is a piece of original scholarship written under the direction of a faculty advisor. It will respond to a relevant debate and will bring new evidence and arguments.

Compétence à acquérir :

- To develop critical thinking.
- To write a state of the art on a hot topic.

Security Systems Audit and Big Data

ECTS : 6

Description du contenu de l'enseignement :

- Overview of Standards and Methods (ISO2700X).
- Legislative context.
- Key security concepts and key business processes, including organizational security, logical security, physical security, network security.
Introduce the main concepts of information security and security auditing.

Compétence à acquérir :

- Being able to assess IT security level in an organization.
- Provide advice about security methodologies.

Security, Regulation and Compliance

ECTS : 3

Description du contenu de l'enseignement :

- Data regulation in various regions (EU, US, ASIA, ROW).
- Privacy regulation and their impact on Big Data policies.
- Compliance Frameworks and methodologies.
- How to avoid data breach with data security rules.
- Geostrategy of data.

- Give students an introduction to data regulation so that they will be able to develop proper Big Data analysis in compliance with regulations.

Compétence à acquérir :

- Understand the regulations at work in various region about Big Data.
- Assess the potential data set in regard with.

Stage appliqué

ECTS : 3

Description du contenu de l'enseignement :

- Defense of a report describing the professional skills acquired during the internship. Defenses occur during the first week of September and are individual.
- Professional embedding in digital companies.

Compétence à acquérir :

- Personal development and "savoir-être" in a professional environment.
- Independent problem solving.

Strategic management and Data driven business models

ECTS : 6

Description du contenu de l'enseignement :

Leveraging value of data: data collection and monetization.
- Building and managing network effects
- Leveraging the value of users (User generated Content and Customer as a resource)
- Platform business models.
- Data driven Business models.

- The world digitization leads to new types of organizations that scholars and policy makers define as platforms. This course gives participants concepts and analytical tools to understand the logic of those new type of business models. The digital foundations of platforms will be analyzed: datafication, networks effects, collective intelligence, digital infrastructure. Building and managing a digital platform is also fully described. Various platform generic business models are presented demonstrating the large potential of such new way of organizing economic transactions.

Compétence à acquérir :

- Understand the platform organizations.
- Building and managing network effects.
- Designing a data driven business model.
- Engaging customers and users in the value proposition.
- Mastering various data driven and digital business models.