BACHELOR OF BUSINESS ADMINISTRATION

2024-2025

YEAR 4

BIG DATA & MANAGEMENT

PROGRAMME SUPERVISOR(S) :

Luisa ROCHA DA SILVA

Marc GIBIAT

YEAR 4 – Autumn Semester

CORE COURSES

Course code	Title	ECTS Credits
FINTECH	Fintech	3
SUPPLY	Supply chain management and Big Data	3
PERS	Personnalisation et recommendation systems	3
OPER	Operations management and Big Data	3
IND40	Entreprise 4.0	3
BI	Business intelligence	3
INTER	Management of international trade operations	3
DEC	AI and decision making	3
RMII	Research methodology II	3
ENERG	Responsible AI II – Energy and sustainable business	3

BBA – Big data & Management

YEAR 4 – Spring Semester

CORE COURSES

Course code	Title	ECTS Credits
STAGE3	Final internship	30

BACHELOR OF BUSINESS ADMINISTRATION

2024/2025 - Year 4 - Autumn Semester

Fintech [BDM_FINTECH]

LEAD PROFESSOR(S): Luisa ROCHA DA SILVA

Requirements

Objectives

The objectives of this course are
- to provide strong foundation for data analytsis and application area related to it and understand the underlying core concepts and emerging technologies in data analysis
- to visualize and and analize data to communicate stastistical results
Students will learn financial concepts relevant to asset allocation and risk management. These concepts will be introduced using statistics and mathematics and illustrated through examples and applications in Excel. In particular, several asset valuation methods will be discussed and employed in applications in the context of M&A transactions. The course will also include elements of operational risk management.

Course contents

- Stock market indexes
- Price adjustments
- Financial returns
- Return mean and variance
- Return skewness and kurtosis
- Basic portfolio management
- Return semi-variance
- VaR
- Mergers and acquisitions
- Operational risk

Course material

Campbell, Lo et MacKinlay (1997), The Econometrics of Financial Markets, Princeton University Press.

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	3	0 hrs	24 hrs	0 hrs	0 hrs	2 hrs

Supply chain management and Big Data [BDM_SUPPLY]

LEAD PROFESSOR(S): Luisa ROCHA DA SILVA

Requirements

Objectives

Students who complete this course successfully will be able to:
- Identify accurate and comprehensive sources of operational data for supply chain analytics
- Create a data depository for supply chain analytics
- Learn different supply chain analytics techniques adapted to different situations
- Frame recommendations based on actionable insights from supply chain analytics

Course contents

This course will begin by introducing the basic concepts of supply chain analytics, such as its components, types, and integration into organizational processes. Next, we will move into supply chain metrics and key performance indicators, including aligning supply chain analytics with strategic goals. Finally, we will perform use cases illustrating how to apply supply chain analytics techniques in different contexts like demand forecasting, production planning and control, and material requirements planning. Tackled concepts are :

1) Basic concepts : Components of supply chain analytics, Types of analytics, Big data and supply chain integration, Approaches to implementing supply chain analytics

2) Supply chain metrics and KPIs : Supply chain strategies and KPIs, Maturity, reference, and benchmark models

3) Supply chain analytics applications : Demand forecasting, Procurement reporting, Material requirements planning, Scheduling and routing, Production planning and control

4) The future of supply chain analytics : New sources of relevant big data, Integrated and embedded analytics, Prescriptive and cognitive analytics tools, New applications of supply chain analytics

Course material

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	3	0 hrs	24 hrs	0 hrs	0 hrs	2 hrs

Personnalisation et recommendation systems [BDM_PERS]

LEAD PROFESSOR(S): Yashar NAGHDI

Requirements

Objectives

This course proposes to study the algorithms and techniques that make it possible to obtain personalized recommendations. Students will learn to build and evaluate recommender systems using different approaches, including collaborative filtering, content-based filtering, hybrid methods.

Course contents

Lectures :
- Matrix factorization and latent factor models
- Similarity measures and nearest neighbor search
- Evaluation metrics for recommender systems
Exercises:
- Implement a collaborative filtering algorithm to recommend movies or products.
- Build a content-based recommender system using text descriptions or user profiles.
- Evaluate the performance of different recommendation algorithms on a benchmark dataset.
- Design a hybrid recommendation system that combines several approaches.

Course material

Online ressources :
- Build a Recommendation Engine With Collaborative Filtering
- Collaborative Filtering

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	3	0 hrs	24 hrs	0 hrs	0 hrs	2 hrs

Operations management and Big Data [BDM_OPER]

LEAD PROFESSOR(S): Luisa ROCHA DA SILVA

Requirements

Objectives

By the end of this module the students should be able to:

1) Define the scope of operations management activities within and across organisations,

2) Critically reflect on the strategic role of operations and its relation to organisational performance

3) Appreciate of the role of operational activities in addressing environmental and societal challenges.

Objectives of the course are :

- To provide a holistic strategic view of operations and supply chain management as a source of competitive advantage.
- To understand the underlying dimensions of operations and supply chain strategies.
- To understand the key techniques and tools employed in the field of operations and supply chain management.
- To understand where operations and supply chain management fits within the business decision making strategies building on other subject areas that have been taught in the Majeure program.
- To facilitate business research into operations and supply chain management in practice.
- To understand the differences in operation management strategies between manufacturing and service organisations.
- To understand the role of sustainability in operations and supply chain management
- To prepare students for a variety of industrial and commercial roles.

Course contents

4V's, I/P Matrix, Product process matrix, process design (Little's Law), layout design, planning and control methods, lean operations and JIT, risk management

Course material

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	3	0 hrs	24 hrs	0 hrs	0 hrs	2 hrs

Entreprise 4.0 [BDM_IND40]

LEAD PROFESSOR(S): Luisa ROCHA DA SILVA

Requirements

Objectives

At the end of the course the students will be able to understand the main processes in an industrial company and how data science are able to help the experts in their daily tasks.

Concretely, the courses will be divided into five sections. Every section presents one topic with an introduction course and practical classes for training.

Course contents

This course will address the following items:
- Design
- Industrial processes
- Control of sequential production systems
- Maintenance

Course material

Introduction to Manufacturing Processes, Schey, John A

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	3	0 hrs	24 hrs	0 hrs	0 hrs	2 hrs

Business intelligence [BDM_BI]

LEAD PROFESSOR(S): Luisa ROCHA DA SILVA

Requirements

Objectives

The objective of this course is to show students how to use raw data to do strategic analysis, using different tools to use Business Intelligence tools. These tools special functionalities of Excel and Tableau:
- Power Query is a Excel functionality that facilitates and automates data manipulation. It allows the extraction of raw data collected by the company's internal applications and to manipulate them in order to format them for the implementation of analysis and visualization processes
- Tableau is a soware capable of connecting to a data source of different formats (Excel, flat file, database, etc.) and which allows to produce

Course contents

Big Data, Data, Information, Knowledge, Methods and tools for data analysis and processing, Data modeling, Relational models, Business Intelligence, Interactive dashboards, Pivot tables, Data visualization, Storytelling

Course material

Vidgen, R., Kirshner, S., Tan, F. (2019). Business analytics : a management approach. Bloomsbury.
Noro, B. (2023). Business Intelligence avec Excel : des données brutes à l'analyse stratégique . (2e éd.). Éditions ENI.
Business Intelligence simple et efficace avec Excel et PowerPivot. Jean-Philippe Gouigoux, 2014
Rigollet, P. (2016). Analyser efficacement vos données : à l'aide des tableaux croisés dynamiques . Éditions ENI.
Knaflic, C-N. (2019). Datavisualisation : utilisez le storytelling pour faire parler vos données. Pearson.

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	3	0 hrs	24 hrs	0 hrs	0 hrs	2 hrs

BACHELOR OF BUSINESS ADMINISTRATION

2024/2025 - Year 4 - Autumn Semester

Management of international trade operations [BDM_INTER]

LEAD PROFESSOR(S): Luisa ROCHA DA SILVA

Requirements

Objectives

The course is designed to provide students a pragmatic approach of International Trade operations, taking into consideration Countries' economical strengths, Free-Trade Agreements, Transport & Logistics constraints and Human aspect. Some geopolitical points will be discussed. To put into practice the studied themes, students will do 2 serious games: in the first one they'll be separated into groups representing World's areas; in the second one, they'll be different business actors working all together.

Course contents

The lecture starts with main Economics Models and Theories (Adam Smith / Ricardo / HOS / Krugman). We'll also discuss the Free-Trade's Myths. We'll see the main products imported and exported from World's areas. The second part will be dedicated to International Business Practices, focusing on Supply Chain, INCOTERMS, Letter of Credit and Payment modes, Transport Documents as well as Customs procedures. Transport Modes will be detailed depending on the kind of products that need to be exported (from Agricultural products to Industrial Projects and Luxury Industry).

Course material

1/Law of diminishing Returns/ Jacob Clifford
2/ International Economics: Theory and Policy, By Krugman, P.R., Obstfeld, M., and Melitz, M. (2018).
3/The Benefits of Free Trade: Addressing Key Myths, By Donald J. Boudreaux and Nita Ghei (2018).
4/ Alphaliner.com
5/ Mariner's vlog on Panama and Suez Canal and Artic Route
6/ Video on P.R.C.'s Belt Road Initative with New Silk Road and String of Pearls.
7/Prisoners of Geography: our world explained in 12 simple maps By Tim Marshall
8/ http://wits.worldbank.org and https://www.macmap.org/

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	3	0 hrs	24 hrs	0 hrs	0 hrs	2 hrs

This syllabus is not a legally binding document. Content is subject to change year on year.

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AI and decision making [BDM_DEC]

LEAD PROFESSOR(S): Luisa ROCHA DA SILVA

Requirements

Objectives

This course will examine how AI is revolutionizing decision-making in various fields. Students will discover AI techniques for decision support, optimization and automation. The course will also address the ethical implications and potential biases of decisions made by AI.

Course contents

Technical aspects :
- Decision trees and random forests
- Markov decision processes and reinforcement learning
- Optimization algorithms
Exercises:
- Build a Decision tree model to classify loan applications or medical diagnoses.
- Use optimization algorithms to solve resource allocation or scheduling problems.

Course material

Smith, Chris (2017) Decision Trees & Random Forests : A visual introduction for beginners.

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	3	0 hrs	24 hrs	0 hrs	0 hrs	2 hrs

Research methodology II [BDM_RMII]

LEAD PROFESSOR(S): Luisa ROCHA DA SILVA

Requirements

Objectives

Understand research terminology.
Be familiar with the attributes of researchers.
Describe quantitative, qualitative and mixed methods approaches to research.
Prepare bibliographic research.
Open science and open data concepts

Course contents

Digital ID of researchers
Qualitative research methods
Literature review:
  - Systematic literature review
  - Content analysis
  - Bibliography citation management
Scientific writing
  - Basics of scientific writing
  - Structured scientific writing
  - Writing a research proposal
  - Writing an article
Open science and open data

Course material

C R. Kothari, "Research methodology, methods and techniques", Springer, 2008.

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	3	0 hrs	24 hrs	0 hrs	0 hrs	2 hrs

Responsible AI II – Energy and sustainable business [BDM_ENERG]

LEAD PROFESSOR(S): Luisa ROCHA DA SILVA

Requirements

Objectives

This course will provide a general understanding of the energy consumption and environmental impact of AI technologies, particularly Cloud Computing technology. Students will learn how to measure and optimize the energy efficiency of AI models and infrastructure. The course will also explore the broader context of sustainable business practices in the AI industry.

Course contents

Technical learnings :
- Optimizing Cloud Infrastructure for Energy Efficiency
- Analysis of the carbon footprint of AI applications
- Hardware acceleration for energy-efficient AI
Exercises:
- Compare the energy efficiency of different cloud providers for a specific AI workload.
- Develop a strategy to reduce the carbon footprint of an AI-powered application.
- Research and present emerging technologies for sustainable AI, such as neuromorphic computing or energy harvesting.

Course material

On-line ressources :
- The green behind the cloud
- How Does The Cloud Help Businesses Be More Sustainable?

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	3	0 hrs	24 hrs	0 hrs	0 hrs	2 hrs