MASTER OF SCIENCE IN BUSINESS INTELLIGENCE AND BIG DATA ANALYTICS

PROGRAMME STRUCTURE

Hours of total learning: 2.250
Total Contact Hours: 450
Supervised Placement and Practice Hours: 400
Self Study Hours: 600
Assessment Hours: 800
Program Credits: 90 ECTS
EQF/MQF level 7
Duration: 18 months - 72 weeks
Mode of Delivery: Fully Online Learning
Language of Instruction: English
Mode of Attendance: Full Time

The programme structure includes different study and assessment material and activities that will be developed in a synchronous and asynchronous modality. The following units will delivered asynchronously:

- Pre-recorded lectures
- Assignment
- Project and research activities

To guarantee the direct interaction among students and professors and to monitor the student's progress and results, the following units are offered synchronously:

- Webinars (live class sessions)
- Forums
- Synchronous section (one to one meeting with tutors or professors)

In addition, the following involve synchronous invigilation so as to maintain the integrity of the exam and assessment model:

- Mid-term assessment or test
- Final exam (open question)

The master's degree lasts 18 months and is divided into 3 semesters of 6 months each. Each semester includes:

1st semester: 4 courses
2nd semester: 4 courses
3rd semester: 1 course + final project

Module/Unit Title	Compulsory (C) or Elective (E)	ECTS (Figures must be whole integers and with a value of at least 1 ECTS)	MQF Level of each module	Mode of Teaching (Lectures, workshop, placement, asynchronous, forums, VLE, etc.)	Mode of Assessment (Examination, assignment, project, blog, etc.)
BI501 Python for Data Science and AI	C	8	7	Pre-recorded lectures, webinars, forums, synchronous sections	Mid-term assessment Final exam open question Assignments Project and research activities
BI502 Data science and data management	C	8	7	Pre-recorded lectures, webinars, forums, synchronous sections	Mid-term assessment Final exam open question Assignments Project and research activities
BI503 Business Analytics and Quantitative methods	C	8	7	Pre-recorded lectures, webinars, forums, synchronous sections	Mid-term assessment Final exam open question Assignments Project and research activities
BI504 Digital Business and Innovation	C	6	7	Pre-recorded lectures, webinars, forums, synchronous sections	Mid-term assessment Final exam open question Assignments Project and research activities
BI505 Artificial Intelligence	C	8	7	Pre-recorded lectures, webinars, forums, synchronous sections	Mid-term assessment Final exam open question Assignments Project and research activities
BI506 Machine Learning	C	8	7	Pre-recorded lectures, webinars, forums, synchronous sections	Mid-term Assessment Final exam open question Assignments Project and research activities
BI507 Risk Management	C	8	7	Pre-recorded lectures, webinars, forums, synchronous sections	Mid-term assessment Final exam open question Assignments Project and research activities
BI508 Artificial Intelligence applications for Business	C	8	7	Pre-recorded lectures, webinars, forums, synchronous sections	Mid-term Assessment Final exam open question Assignments Project and research activities
BI509 Business process and Marketing Analytics	C	8	7	Pre-recorded lectures, webinars, forums, synchronous sections	Mid-term Assessment Final exam open question Assignments Project and research activities
CS510 Project Work	C	20	7	Pre-recorded lectures, webinars, forums, synchronous sections	Project work presentation to the master committee

Python for Data Science and AI: MQF/EQF Level 7 – 8 ECTS

This course introduces computer programming using the Python programming language, with a strong emphasis on its applications in business analytics and intelligence. Emphasis is placed on common algorithms, programming principles, and the extensive standard library distributed with Python. Throughout the course, students will gain hands-on experience in using Python for data analysis, data visualization, and building business intelligence tools. Upon completion, students will possess a solid understanding of Python syntax and the key mechanisms of object-oriented programming. They will be proficient in designing, coding, testing, and debugging Python programs, with a specific focus on their application in business analytics and intelligence contexts.

Data science and Data management: MQF/EQF Level 7 – 8 ECTS

This course introduces the essential elements of data warehouse development, including design, acquisition, management, analysis, query, mining, and visualization, with a focus on fulfilling the informational and analytical needs of an enterprise. It explores the concepts of data warehouses and data marts from various perspectives, including their purpose, architecture, utilization, and security. Students will learn the process of creating a data warehouse or data mart solution, starting from identifying an enterprise's informational and analytical needs to producing business intelligence (BI) by extracting valuable insights using data mining methods and models. The course also addresses the effectiveness of data warehousing in supporting strategic decision-making.

Business Analytics and Quantitative Methods: MQF/EQF Level 7 – 8 ECTS

This course aims to enhance students' understanding of statistics and emphasizes applying statistical techniques to solve business problems across various business areas. The course covers topics such as displaying and describing categorical and quantitative data, probability models, normal and other continuous distributions, sampling distributions, confidence intervals for proportions and means, hypothesis tests for proportions and means, comparing two means, correlation, linear regression, and chi-square tests.

Digital Business and Innovation: MQF/EQF Level 7 – 6 ECTS

In today's rapidly evolving digital landscape, technology is revolutionizing the way business is conducted. To thrive in this dynamic environment, business leaders must cultivate analytical and innovative skills. This course offers students a comprehensive understanding of the profound impact of entrepreneurship and digital business. Throughout the course, students will analyze digital transformation and disruption within companies and organizations. They will develop specialized competencies in business innovation, online business strategies, start-up creation, online management, and leadership. By examining current case studies, students will gain practical insights and hands-on experience. Additionally, the course provides the opportunity to design innovative e-business models and applications, preparing students to excel in the digital age.

Artificial Intelligence: MQF/EQF Level 7 – 8 ECTS

In this course, students will explore the foundational theories and practical applications of artificial intelligence (AI). The course delves into the design of intelligent agents and their interactions with the environment, providing a thorough understanding of agent behavior. Furthermore, the course extensively covers search algorithms for problem-solving, complemented by relevant applications and examples. The primary objective is to equip students with the skills to leverage these algorithms and intelligent agents to address complex problems effectively. Additionally, the course introduces the concept of AI security and examines the impact and implications of AI on cybersecurity. Through this exploration, students will gain insight into the importance of safeguarding AI systems and understanding the broader cybersecurity landscape.

Machine learning: MQF/EQF Level 7 – 8 ECTS

This course introduces students to the fundamentals of machine learning and data analytics in the context of big data, with a particular focus on applications in business intelligence. The course begins with an overview of key concepts and metrics related to big data and the motivation for adopting machine learning-based analytics. Students will explore both supervised and unsupervised learning algorithms through theoretical discussions and practical, hands-on labs. These labs are designed to equip students with the skills needed to apply machine learning techniques effectively in research or industry settings, particularly for enhancing business intelligence and decision-making processes. By the end of the course, students will be proficient in leveraging machine learning to analyze large datasets, extract actionable insights, and support strategic business decisions.

Risk Management: MQF/EQF Level 7 – 8 ECTS

This course introduces students to essential risk management frameworks, standards, and processes within the context of business intelligence and analytics. Students will gain both theoretical understanding and practical skills in risk management mitigation, evaluation, and analysis. Throughout the course, students will explore various risk assessment techniques and learn how to implement strategies to safeguard organizational assets effectively. They will develop an understanding of the intricate relationship between assets, vulnerabilities, threats, and risks, drawing insights from contemporary case studies. Topics covered include: Practical implementation of risk management strategies, techniques for risk assessment and analysis, strategies for asset protection and mitigation of vulnerabilities, understanding the relationship between assets, threats, and risk.

Artificial Intelligence applications for Business: MQF/EQF Level 7 – 8 ECTS

The course builds on a relational understanding of Artificial Intelligence (AI) and focuses on opportunities, limitations, and challenges associated with the organisational use of AI for value creation. Students will explore various types of AI technologies and their emergence within organizational and business contexts. Through theoretical frameworks analyzing the interplay between organizations and technology, the course emphasizes how AI introduces new challenges at both organizational and societal levels. Against this backdrop, students will delve into operational and strategic approaches for understanding, managing, and leveraging AI to create value within businesses.

Business process and marketing analytics: MQF/EQF Level 7 – 8 ECTS

This course addresses the methods and techniques required to analyze, design, implement, automate, and evaluate business processes, including marketing analytics. By presenting the phases of the Business Process Management (BPM) life cycle, students learn to analyze organizational performance from a process perspective. They will also develop the knowledge and skills needed to: redesign processes using value-focused techniques, create workflows and implement them in BPM systems, simulate new process designs, and develop process analytics applications using dashboards. Additionally, students will explore how marketing analytics techniques can be integrated into business processes to optimize marketing strategies, target audience identification, campaign performance evaluation, and customer relationship management. Through practical applications and case studies, students will gain insights into leveraging marketing analytics to drive informed decision-making and enhance organizational performance.

Project Work: MQF/EQF Level 7 – 20 ECTS

The Master's Project work provides a means for both practical applications of the knowledge and skills obtained through classwork and extended, in-depth work on a focused project. Through the project, students have opportunities to gain experience in specific areas of interest or career development.. Each student will be assigned a faculty member who will be his/her project advisor Project Advisor. The project advisor provides primary research guidance and mentorship to the student, by suggesting the use of resources, which may include lab/working space, any instruments, computers, software, or other technical equipment. The student, in consultation with his/her Project Advisor, is responsible for selecting an appropriate project topic, an overall plan of work, and a time schedule for completion. Students are required to present to the project advisor a proposal which must contain an introduction to the problem, a statement of the problem, significance and impact, the aims of the project, a description of the methods, and a realistic project timeline. The Master's Project is approximately 10,000 words in length, equivalent to 20 pages single-spaced and 40 pages double spaced. Once the project will be completed and approved by the project advisor, the student must present it by videoconference to the master committee.