Business Analitics and Artificial Intelligence

MASTER'S DEGREE MBA IN INTERNATIONAL MANAGEMENT

UNIVERSIDAD INTERNACIONAL MENÉNDEZ PELAYO

This document can be used as reference documentation of this subject for the application for recognition of credits in other study programmes. For its full effect, it should be stamped by UIMP Student's Office.

GENERAL DATA

Brief description

• Strategic vision: To provide students with a critical view of the strategic potential of data science for business management in international environments.
• Theoretical foundations: To understand the theoretical concepts necessary to develop Business Analytics (BA), Big Data and Artificial Intelligence (AI) projects.
• Competence in tools: To work with various platforms and tools to manage, analyse and visualise big data relevant to companies and organisations.
• Technological opportunities: To identify opportunities in BA, Big Data and AI in order to create additional and sustainable value opportunities for digital transformation of the company.

Name

Business Analitics and Artificial Intelligence

Code

102798

Academic year

2024-25

Degree

MASTER'S DEGREE MBA IN INTERNATIONAL MANAGEMENT

ECTS Credits

2

Type

MANDATORY

Duration

Cuatrimestral

Language

Spanish/English

CONTENTS

Contents

Module 0. Strategic potential of data science in business

• Business analytics (BA), Big data and Artificial Intelligence (AI)
• Illustrating the business value of data science in business management
• SAS: Global leader in enterprise applications and business AI
• Microsoft: Leading platform with end-to-end solutions for BI, Big Data and AI

o Knowledge assessment (EC0): Level questionnaire (individual, non-assessable)
o Practical implementation (AP0): Installation and familiarisation with BA platforms (in group, non-assessable)

Module 1. Technical fundamentals for understanding a data-driven project

• Introduction to data analysis
• Stages of a data-driven project
• Components and compilation
• Navigation through BA platforms and tools: SAC and Microsoft Power BI environments

o Knowledge assessment (EC1). Module 1 questionnaire (individual, assessable)
o Practical implementation (AP1). Exploration of real case studies on BA platforms (in group, assessable in ‘BA Case’)

Module 2. Data preparation for modelling

• Data types and data sources
• Storage and connectivity
• Extract, Transform and Load (ETL)
• Data preparation: SAC and Microsoft Power BI environments

• Knowledge assessment (EC2). Module 2 questionnaire (individual, assessable)
• Practical implementation (AP2). Data preparation (ETL) (in group, assessable in ‘BA Case’)

Module 3. Data modelling to create reports and dashboards

• Fundamentals of modelling
• Structure and design of a data model
• Options for extending data models
• Creation of a semantic model: SAC and Microsoft Power BI environments

o Knowledge assessment (EC3): Module 3 questionnaire (individual, assessable)
o Practical implementation (AP3). Data modelling (in group, assessable in ‘BA case’)

Module 4. Creation of business reports and dashboards

• Types of graphs
• Reporting and business intelligence reports
• Dynamic data visualisation
• Examples of business reports and dashboards: SAC and Microsoft Power BI environments

o Knowledge assessment (EC4). Module 4 questionnaire (individual, assessable)
o Practical implementation (AP4). Report writing on BA platforms (as a group, assessable in ‘BA Case’)

Module 5. Optimisation and analysis of reports using AI

• Improving report layouts
• Extension capabilities with custom widgets
• Potential of AI for data analysis
• Analysis and extensions: SAC and Microsoft Power BI environments

o Knowledge assessment (EC5). Module 5 questionnaire (individual, assessable)
o Practical implementation (AP5). Analysis and optimisation of a report on BA platforms (as a group, assessable in ‘BA Case’)

Module 6. Strategic queries on data and business analytics

• Introduction to queries in BA
• Development of the service proposal
• Presentation of a business consultancy report
• Good practices and success stories in BA projects

o Knowledge assessment (EC6). Module 6 questionnaire (individual, assessable in ‘BA Case’)
o Consultancy case (BA Case). Presentation of results to client company (as a group, assessable in ‘BA Case’).

Module 7. AI, machine learning and deep learning

• Introduction to AI. Types and examples
• Fundamentals of machine learning and deep learning
• AI and machine learning platforms
• Applications and case studies: NLP and computer vision

o Knowledge assessment (EC7). Module 7 questionnaire (individual, assessable)
o Practical implementation (AP6). Experimenting with Python (as a group, assessable in ‘IA Case’)

Module 8. Generative AI: Models, applications and ethics

• Introduction to generative AI. Generative AI families by typology
• Models and platforms for generative AI
• Generative AI applications: Use cases

• Generative AI and ethics

o Knowledge assessment (EC8). Module 8 questionnaire (individual, assessable)
o Practical implementation (AP7). Fieldwork for ‘AI Case’ (as a group, assessable in ‘AI Case’)

Module 9. Implementation of AI in companies: Case studies and applications

• Problems to be solved and solutions to be devised in the company. Classification by functional areas
• Analysis of data, models and platforms used
• Impacts achieved and opportunities for scaling up. Challenges.
• Exploring new opportunities for innovation and value creation in the company

o AI Case (AP9). AI study in business management (as a group, assessable in ‘AI Case’)

Module 10. AI in critical industries: Success stories and trends

• AI use cases in different industries: Context and relevance
• Analysis of data, models and platforms used
• Impacts achieved and opportunities for scaling up. Challenges.
• Exploring AI opportunities in strategic industries: Trends and opportunities.

o AI Case (AP9). AI study in a strategic industry (as a group, assessable in ‘AI Case’)

COMPETENCES

Conocimientos

CO1 - To learn about business management analytics in dynamic and complex environments, such as the international environment.

CO2 - To acquire a body of theoretical and practical knowledge and learning skills, which will enable those who remain interested to pursue further, more specialised studies in the field of advanced research or doctoral studies.

CO3 - To master the basic tools of information and communication technologies for exercising of their profession and for learning.

CO5 - To understand the nature of problems in the organisation and therefore the application of suitable tools by developing analytical skills.

CO13 - To learn to incorporate the concept of sustainability in business and institutional projects, identifying its specific areas of practical application.

CO14 - To learn to incorporate other SDG concepts, which are also relevant for international companies, in their projects, identifying their specific areas of practical application.

CO15 - To know the necessary tools for obtaining, manipulating and interpreting all accessible data that are relevant for modern company management with special emphasis on data analytics and artificial intelligence.

Habilidades

S1 - To apply the theoretical and practical knowledge acquired, with a high degree of independence, in both national and international companies, be they small or medium-sized or companies of a more multinational dimension, and even in non-business organisations whose management requires an international vision.

S2 - To apply the analytical skills acquired in defining and approaching new problems and in searching for solutions both in a national and international business context.

S3 - To be able to collect, record and interpret macroeconomic data, country information, industry and business information, financial and accounting data, statistical data, and relevant research results to systematise business decision-making processes in international environments.

S6 - To manage digital platforms, technological, audiovisual and computer media to search for information and for effective communication of business projects.

S7 - To manage software and statistical programmes for data recording and analysis.

S16 - To implement Business Analytics, Big Data and Artificial Intelligence tools in the field of

business organisations to improve efficiency, decision-making, innovation, customisation and customer service, and cyber security.

Competencias

C1 - To work in multidisciplinary and multicultural teams, in highly demanding situations in terms of time (deadlines for designing and executing projects and cases) and results.

C2 - To develop business and personal activities within the strictest ethical and socially responsible behaviours, as well as to develop sensitivity towards social and environmental issues.

C5 - To work in a team, prioritising the precision of the results and the soundness and originality of the proposals. .

C7 - To apply the experience acquired in problem-solving supported by advanced decision-making tools.

LEARNING PLAN

Training activities

Type of activity	Hours	% On site
TA1.- Master classes	9	100
TA2.- Practical classes	9	100
TA3.- Individual and group work	18	5
TA5.- Individual student work	14	0

Teaching methods

This subject will use the ‘Flipped Classroom’ methodology (Bergmann, J., & Sam, 2012). Students will study and prepare content individually and in groups outside the classroom, while face-to-face sessions will focus on highly participatory and practical activities. This approach facilitates more active and collaborative learning, allowing students to apply and consolidate their knowledge in class.

The duration of the course is 5-6 weeks of classes with a total effort of 50 hours (see table 1).

Table 1. Course planning (2 ECTS credits)

Activity	Duration (hours)	Description
Face-to-face classes	18	12 face-to-face sessions each lasting 90 minutes. (11 lectures/practical classes + 1 exam)
Independent work (individual)	14	14 independent (individual) work sessions each lasting 60 minutes. These sessions are designed for students to prepare the theoretical content prior to the face-to-face classes and, individually, to familiarise themselves with the theoretical content of the course.
Independent work (in groups)	15	9 independent work sessions (in groups) each lasting 120 minutes. These sessions are designed for students to apply the theoretical contents after the face-to-face classes and work in groups.

The face-to-face sessions aimed at learning the theoretical foundations and exploring BA and AI

tools and platforms will have a ‘lecture/practical work’ structure (see table 2). The session for the BA and IA case study will follow a ‘Case Presentation’ structure (see table 3):

Table 2. Structure of face-to-face classes (lectures/practical work)

Activity	Duration (minutes)	Description
Description	5	The lecturer will give an introduction to the course (session 0). They will then answer questions about the material prepared during the independent (individual) work sessions before the face-to-face classes (1 to 5 and 7 to 8).
Evaluation	15	The students will have to answer a questionnaire individually to evaluate previous knowledge of the subject (session 0) and the theoretical knowledge from the face-to-face class (1 to 5 and 7 to 8).
Practical work	60	Students will work with different BA and AI platforms and tools in teams. This will also help them to carry out the two question case studies that they will work on in face-to-face classes 6, 9 and 10.
Lectures	10	The lecturer will explain key concepts and will present the material that the student will have to work on for the following session in an independent way (individually and/or in groups).

Face-to-face sessions 0, 1, 2, 2, 3, 3, 4, 5, 7 and 8.

Table 3. Structure of face-to-face classes (presentation of cases)

Activity	Duration (minutes)	Description
Welcome	5	The lecturer will give instructions to the students on how to organise the session.
Presentation	80	In groups, the students will present the main conclusions of the work carried out using the theoretical knowledge and the different BA platforms and tools

Takeaway	5	used in the previous sessions (10 minutes per team for the BA case and 20 minutes per team for the IA case). Together with the students, the lecturer will review the main learning or key points of the case study.

Sessions 6, 9 and 10

EVALUATION

Evaluation system

• In its first exam session, the evaluation guidelines and criteria will be the following:

Final exam (FE, 40% of the final grade):

o Duration: 90 minutes
o Formatting and scoring: 50 multiple-choice questions, each with four answer options, only one of which is correct. Correct questions will add 0.2 points to the student’s score, 0.1 points will be deducted for incorrect questions, and no penalty will be given for unanswered questions.
o Contents: 5 of the questions in each module 1 to 10.

A minimum of 4 points will be required in this test in order to be weighted towards the continuous assessment.

Continuous assessment, individual work (Individual CA, 20% of the final grade):

Tests assessing knowledge of modules 1 to 8 (CA1-CA8)

o Duration: 15 minutes
o Formatting and scoring: 10 multiple-choice questions, each with four answer options, only one of which is correct. Correct questions will be awarded 1 point, 0.2 points will be deducted for incorrect questions, and no penalty will be applied for unanswered questions.

IndividualCA=(CA1+CA2+CA3+CA4+CA5+CA6+CA7+CA8)/8

Continuous assessment, group work (CA Group, 40% of the final grade):

o Development and presentation of two cases (BA Case, AI Case). This will require work on practical applications (PA1-PA5) for the BA Case and practical applications (PA6-PA7) for the AI Case.

GroupCA= (BA Case + AI Case)/2

Participation and attitude (P&A, +0.5 points of the final grade):

o In addition to the final grade obtained by the student, the teacher may award up to a maximum of 0.5 extra points depending on the quality of their participation and attitude during the course.

• The calculation of the final grade for the subject, in its first exam session, will be the result of:

Final grade for the course = (0.4*FE) + (0.2*IndividualCA) + (0.4*GroupCA) + PA

• In the 2nd and subsequent exam sessions, the grade will depend on the test(s) (written test type, essay type, assignments, oral tests, etc.), which will be determined by the teachers and communicated to the students sufficiently in advance.

FACULTY

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BIBLIOGRAPHY AND LINKS

Bibliography

• **Compulsory reading.**

These will be provided at the beginning of the course (see “Course documentation” file).

• **Recommended reading.**

o Agrawal, A., Gans, J., & Goldfarb, A. (Eds.). (2019). The economics of artificial intelligence: an agenda. University of Chicago Press.

o Knaflic, C. N. (2015). Storytelling with data: A data visualization guide for business professionals. John Wiley & Sons.

o Provost, F., & Fawcett, T. (2013). Data Science for Business: What you need to know about data mining and data-analytic thinking. Ed. O'Reilly Media, Inc.