



TECHNICAL SHEET OF THE SUBJECT

Data of the subject	
Subject name	Introduction to Business Analytics
Subject code	FCEE-BA-222
Main program	Grado en Análisis de Negocios/Business Analytics
Involved programs	Grado en Análisis de Negocios/Business Analytics y Grado en Relaciones Internacionales [First year] Grado en Análisis de Negocios/Business Analytics y Grado en Derecho [Second year] Grado en Administración y Dirección de Empresas y Grado en Análisis de Negocios/Business Analytics [First year]
Level	Reglada Grado Europeo
Quarter	Semestral
Credits	3,0 ECTS
Type	Obligatoria (Grado)
Department	Departamento de Gestión Empresarial
Coordinator	Dra. Noemí Pérez-Macías Martín
Schedule	For this purpose, consult the timetables of the different groups and degrees in which it is taught
Office hours	Request a tutorial in advance by email
Course overview	Business Analytics is the application of data science techniques to business decision making. This course describes the most common ones and their practical application in different areas of the company. At the end of the course, students acquire: basic knowledge of what one can do and achieve using business analytics; understanding the differences between what is a big data project and what is not; knowing the life cycle of a business analytics project; understanding the differences between supervised learning and unsupervised learning as well as some of the principal algorithms; finally understanding the importance of privacy.

Teacher Information	
Teacher	
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SPECIFIC DATA OF THE SUBJECT

Contextualization of the subject
Contribution to the professional profile of the degree
<p>The course is an introduction to the vast field that is business Analytics. It is the first contact of the students with this central area of knowledge, which then later in the following courses will be developed in specific subjects. This professional profile requires diverse skills, such as business vision and the scientific-mathematical approach to problems. Then, it is important to maintain a balance between practice and theoretical foundation, that is why the learning by doing methodology will be used.</p> <p>In block 1 the student is given a framework to see why business analytics is important and what you can get out of it. It also presents the</p>



concepts and definitions of what Business Analytics is, and the life cycle that Business Analytics projects usually follow.

Block 2 is the most practical block through which students will see an introduction to the main supervised and unsupervised learning models and their difference. The objective is for students to understand how the simplest models are built.

Block 3 explains the existing legal framework, the importance of privacy and the different anonymisation techniques.

Prerequisites

Basic Knowledge of Excel

Competencies - Objectives

Competences

GENERALES

CG01	Capacidad de organización y planificación en la identificación de problemas en el contexto de datos masivos	
	RA1	Describe, relaciona e interpreta situaciones y planteamientos de nivel medio
	RA2	Selecciona los elementos más significativos y sus relaciones en las situaciones planteadas
	RA3	Es capaz de enfrentarse con el estudio analítico de casos y escenarios, así como de llevar a efecto síntesis de información y de datos, empleando los conceptos adecuados.
CG02	Capacidad de análisis de datos masivos procedentes de diversas fuentes: texto, audio, numérica e imagen	
	RA1	Identifica y define, adecuada y proactivamente, un problema y sus posibles causas
	RA2	Plantea posibles soluciones pertinentes y diseña un plan de acción para su aplicación
CG04	Capacidad para elaborar proyectos e informes de manera oral y escrita, difundiendo estas ideas a través de canales digitales	
	RA1	Es capaz de buscar y analizar información procedente de fuentes diversas, haciendo un uso eficaz de las herramientas digitales
	RA2	Discierne el valor y la utilidad de diferentes fuentes y tipos de información, contrastándolas, analizándolas críticamente e incorporando valoraciones propias.
	RA3	Incorpora la información a su propio discurso, citando adecuadamente las fuentes que utiliza
CG06	Habilidades interpersonales en la sociedad de la información: escuchar, argumentar y debatir	
	RA1	Utiliza el diálogo para colaborar y generar buenas relaciones, escuchando las opiniones de los demás y estableciendo diálogos constructivos
	RA2	Comunica sus ideas de manera efectiva y argumentada



	RA3	Conoce la técnica del debate y la oratoria y sabe emplearla en cuestiones profesionales
CG08	Capacidad crítica y autocrítica en la sociedad de la información	
	RA1	Identifica los supuestos y las limitaciones de métodos y teorías
	RA2	Identifica, establece y contrasta hipótesis, variables y resultados de manera lógica y crítica
	RA3	Es capaz de construir un discurso propio, en un contexto de intercambio de opiniones.
CG09	Compromiso ético en la sociedad de la información	
	RA1	Persigue la excelencia en las actuaciones profesionales
	RA2	Se preocupa por las consecuencias que su actividad y su conducta pueden tener para los demás
	RA3	Incorpora en su discurso y en sus propuestas de actuaciones, las consecuencias que las mismas pueden tener para los distintos stakeholders de una organización global
CG11	Capacidad para aprender y trabajar autónomamente en la sociedad de la información	
	RA1	Es capaz de recopilar, preparar y ampliar información con carácter previo a su participación en actividades que implican la construcción de un discurso propio argumentado o la propuesta de soluciones innovadoras a un problema
	RA2	Realiza sus trabajos y su actividad necesitando sólo unas indicaciones iniciales y un seguimiento básico, poniendo en práctica las habilidades necesarias para la investigación independiente
	RA3	Busca y encuentra recursos adecuados para sostener sus actuaciones y realizar sus trabajos
ESPECÍFICAS		
CE01	Comprender la naturaleza de la analítica de negocio y de sus conceptos y herramientas esenciales (análisis estadístico y cuantitativo, modelos exploratorios y predictivos y sistemas de información), orientados a identificar, evaluar y capturar oportunidades derivadas de la información que creen valor para la organización	
	RA1	Comprende cómo se puede utilizar la analítica de negocio para formular y resolver problemas y para apoyar la toma de decisiones directivas
	RA2	Está familiarizado con los procesos inherentes a la analítica de negocio, en especial aquellos relativos al diseño, a la ejecución y a la presentación de conclusiones derivadas de la misma
	RA3	Conoce las herramientas y las principales aplicaciones de software disponibles para llevar a cabo un análisis de negocio determinado
CE02	Conocer y comprender los determinantes básicos de la dirección de empresas, tales como la planificación de objetivos y actividades, su organización y control, sus áreas funcionales y las relaciones con el entorno, así como reconocer la función de liderazgo que el directivo ejerce en la definición y gestión de los mismos.	



	RA3	Conoce herramientas de analítica de datos (o combinaciones de ellas) orientadas a la visualización de información y a la predicción de las dinámicas esenciales del entorno empresarial
CEO01	Comprender y aplicar las herramientas, y los enfoques de la gestión de proyectos	
	RA1	Es capaz de elaborar, dirigir, coordinar y gestionar proyectos de naturaleza diversa, haciendo uso eficaz de las herramientas digitales
	RA2	Identifica las diferencias entre la Dirección de Proyectos y la Dirección de Proyectos de Big Data
	RA3	Entiende el concepto del ciclo de vida aplicado a la gestión de proyectos
	RA4	Posee una visión global de las tareas que comprenden la disciplina de la gestión de proyectos
CEO04	Conocer y comprender los instrumentos y las herramientas necesarios para identificar oportunidades de negocio globales basadas en modelos de negocio innovadores, y para definir y desarrollar un proyecto de emprendimiento en un contexto digitalizado	
	RA1	Conoce herramientas de visualización de información, análisis de redes y técnicas de clasificación y de predicción para identificar nuevas oportunidades empresariales, mercados potenciales desatendidos, nuevos productos y servicios y nuevos modelos de negocio
	RA2	Es capaz de generar y de evaluar críticamente ideas de negocios innovadoras con potencial global
	RA3	Sabe cómo desarrollar un modelo de negocio con potencial global y cómo definir un plan de negocios, concretándolo en un documento que pueda ser sometido a evaluación externa.
	RA4	Entiende las habilidades personales y directivas, y los recursos necesarios para crear una empresa innovadora o para generar proyectos de ¿intraemprendimiento¿, y se compromete con su desarrollo

THEMATIC BLOCKS AND CONTENTS

Contents - Thematic Blocks

The Business Analytics course has been divided into **three blocks**:

BLOCK 1: Introduction to Business Analytics

BLOCK 2: Machine Learning Models

BLOCK 3: Privacy

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Block One

Introduction to Business Analytics

Chapter 1. Introduction



1. Introduction
 - I. Data the new oil
 - II. Data-centric companies
 - III. From data to actionable insights
2. Strategic Planning Process
 - I. Real retail case
3. Knowledge-based organizations
4. Real cases: Netflix and Uber
5. Let's practice

Chapter 2: Concepts to understand Business Analytics:

1. What is Business Analytics (BA)
 - I. Definition of BA
 - II. Big data project & a non-big data project
 - III. Differences between data analysis & data analytics
 - IV. Data Analyst
2. Components Business analytics definition
 - I. Data
 - II. Tools & Techniques
 - III. Business Insights
3. Activities of BA:
 - I. Descriptive analytics
 - II. Diagnostic analytics
 - III. Predictive analytics
 - IV. Prescriptive analytics
 - V. Example of the activities of BA

Chapter 3: The life process of Business Analytics

1. Understand the life process of BA
 - I. Business case evaluation
 - II. Data Identification
 - III. Data Acquisition and Filter
 - IV. Data Extraction
 - V. Data Validation and Cleansing
 - VI. Data Aggregation and Representation
 - VII. Data Analysis
 - VIII. Data Visualization
 - IX. Utilization of analysis results

Block Two

Machine Learning Models

Chapter 4. Machine Learning Models

1. Introduction
 1. What's prediction
 2. What and why predict?

3. What does Learning mean?
4. Correlation and Causality
5. *When should I use predictive models?*
2. Machine Learning
 1. *Machine Learning concept*
 2. *Learning Paradigms in ML*
 3. *Supervised & Unsupervised Models*
 1. *Supervised*
 2. *Unsupervised*
 4. *The process of a ML model*
 5. *Data partition*
 6. *Possible Problems in ML models*
3. Machine Learning Techniques
 1. Supervised learning: Classification & Regression problems
 2. Classification Algorithms
 3. Model Evaluation
 4. Unsupervised models: clustering
4. Let's do a Simulation

Block Three

Privacy

Chapter 5. Privacy: Statistical Disclosure Control (SDC)

1. Introduction
 - I. Definitions
 - II. Legal framework
2. Anonymization: Techniques

TEACHING METHODOLOGY

General methodological aspects of the subject

In-class Methodology: Activities

AF1. Master class lessons in which the teacher will present the main contents in a clear, structured way and seeking the motivation of the student at all times through the support of PowerPoint transparencies, videos, audios, visualizations, etc.

AF2. Participatory sessions of an expository nature. In each master class, the master class will be combined with the debate and/or discussion on the topic in question corresponding to each class. This requires the student to be prepared to discuss the subject of study and the readings, videos, or audios that will be indicated to the student in advance.

The teacher will lead the presentation of the basic notions, with the active and collaborative participation of the students, who will discuss and debate the dark points or nuances that are relevant to the correct understanding of the contents. It will include practical cases as the backbone of the presentation of ideas and content, dynamic presentations, and the formal or spontaneous participation of students through various activities.

Active participation in the classroom is an excellent tool to enhance the learning of the student who participates and his or her peers present in the classroom. A productive learning environment requires that everyone in the classroom be actively involved.



AF3. Individual test resolution. Students will be given short questionnaires about the subject matter dealt with in class to see their degree of progress in the subject

AF4. Cooperative Learning: The goal of this activity is to encourage cooperative work in groups of 4-6 people. The aim is to promote the autonomy and motivation of learning thanks to the shared responsibility. Application of real tools.

AF6. Analysis and resolution of cases proposed by the teacher, based on a brief reading, a material prepared for the occasion, or any other type of data or information that allows the application in practice of the theoretical knowledge acquired, and favors the development of the critical thinking capacity of the student. They are based on the selection of professional materials adapted to the subject, with the aim of training the student to solve real problems and to acquire several capacities to react to unexpected situations and approaches.

AF7. Public exhibition of topics or works. Presentation and defense of their work in front of the teacher and the rest of their classmates. It takes place individually or collectively. It will be valued the conceptual organization, the domain of the treated matter, the expositive clarity, the respect and rationality of the different phases. In the case of being a collective exercise, the active collaboration of each one of the members of the team will be required.

Non-Presential Methodology: Activities

AF8. Individual study and extension of the documentation that the student carries out to understand, re-elaborate and retain scientific content with a view to a possible application in his/her profession. Individual reading of texts (bibliography) and notes of different types (books, magazines, individual articles, press, Internet publications, reports on practical experiences, etc.) related to the subjects of study.

F11. Academic tutoring, for the resolution of problems that may have arisen in the course of learning the subject or in the process of acquiring the corresponding skills, as well as for the supervision of the student's progress in his/her work.

consecución de las metas.

AF12. Monographic research. A cooperative learning procedure that starts with the assignment of students to teams and the approach of a task that requires research, sharing of information and resources among team members in order to achieve the common goal. Individual objectives are achieved if and only if others achieve theirs, so there is a great deal of personal interdependence in achieving the goals.

SUMMARY STUDENT WORKING HOURS

CLASSROOM HOURS			
Lecciones de Carácter expositivo	Ejercicios y resolución de casos y de problemas	Exposición pública de temas o trabajos	
15.00	5.00	5.00	
NON-PRESENTIAL HOURS			
Ejercicios y resolución de casos y de problemas	Simulaciones, juegos de rol, dinámicas de grupo	Sesiones tutoriales	Estudios individual y/o en grupo, y lectura organizada
25.00	10.00	10.00	5.00
ECTS CREDITS: 3,0 (75,00 hours)			

EVALUATION AND CRITERIA

Ratings

- **ORDINARY CALL (CONTINUOUS EVALUATION):**

The final exam (50%)

Multiple choice questions about the course syllabus

Student participation in class and attendance (5%)

The attendance and participation of the student in the classes will be evaluated, both those who are present in the classrooms and those who are connected from their homes

Implementation and discussion of case studies and various practices (35%)

The active participation of the student in the classroom and their capacity for analysis and problem solving will be valued.

Carrying out tests for the monitoring of the subject by the student (10%)

The student's ability to follow the course continuously will be assessed

The final grade will be the weighted sum of the exam and the grade obtained in the continuous assessment through case studies, mini-test, and participation and attendance to class. It is **MANDATORY** to achieve a grade of 5 in **both, the final exam** and the **continuous assessment** to pass the subject of Introduction to Business Analytics.

Attendance is considered essential. Thus, the professor, and according to the academic norms of the university, once verified the lack of attendance of the student in at least one-third of the classes, and with sufficient time before the celebration of the exam corresponding to the ordinary call, will inform the student of the loss of the call. The Dean will be informed of this. In the minutes of the student's ordinary exam, it must appear "Not presented" (R.G. 93.3.).

- **EXTRAORDINARY CALL**

Students who do not pass with the above evaluation criteria may take an extraordinary exam that will be worth 100% of the final grade. Continuous assessment grades are not saved.

Note: Chat GPT will be allowed, although activities will be adapted so that:

- Assignments will avoid being merely descriptive or factual.
- Assignments should include recent data.
- Efforts will be made to link tasks to materials covered in class.
- More oral defenses will be conducted.

BIBLIOGRAPHY AND RESOURCES

Basic Bibliography

Textbooks:

Evans, J. R. (2016). *Business analytics: Methods, models, and decisions*. Pearson.

Herbet, J. (2019). *Analítica de datos: La guía definitiva de análisis de Big Data para empresas, técnicas de minería de datos, recopilación de datos y conceptos de inteligencia empresarial*.

Jank, W. (2011). *Business analytics for managers*. Springer Science & Business Media.

Koole, G. (2019). *An Introduction to Business Analytics*. MG books. Amsterdam



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2023 - 2024

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

Complementary Bibliography

Textbooks:

Diez, D. M.; Barr, C. D., and Cetinkaya-Rundel, M. (2017). *OpenIntro Statistics*, 3r Ed. <http://openintro.org>

Marr, Bernard (2017). *BIG DATA en la práctica: Cómo 45 empresas exitosas han utilizado análisis de big data para ofrecer resultados extraordinarios.* Tell Editorial

Marr, Bernard (2016). *BIG DATA: La utilización del Big Data, el análisis y los parámetros Smart para tomar decisiones y aumentar el rendimiento.* Tell Editorial

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