1. BASIC INFORMATION

Course	STATISTICS AND BIG DATA I
Degree program	MARKETING
School	SOCIAL SCIENCES
Year	FIRST
ECTS	6 ECTS
Credit type	BASIC
Language(s)	ENGLISH
Delivery mode	FACE-TO-FACE (ON SITE)
Semester	SECOND SEMESTER
Academic year	2025/2026
Coordinating profesor	BIG DATA: María Calero, Francisco García Ull STATISTICS: Miguel Galiana Martínez, Javier Pérez, Héctor Gisbert

2. PRESENTATION

Statistics and Big Data are fundamentally about the collection, organisation, analysis, presentation and interpretation of data. Our society currently generates large volumes of data through mobile devices, websites, social networks, wearables, sensors, smart cities and homes, etc. and it is increasingly important to extract information and knowledge from data for decision-making in multiple professional fields: economics, politics, engineering, social sciences, health sciences, etc.

The aim of this subject is to provide students with the basics of Statistics and Big Data, both from a theoretical point of view and as applied to the world of marketing, which will serve as a basis for subjects in future courses.

3. COMPETENCIES AND LEARNING OUTCOMES

Core competencies:

- CB1 - Students demonstrate possession and understanding of knowledge in an area of study that is based on general secondary education, and is generally at a level that, although supported by advanced textbooks, also includes some aspects involving knowledge of general secondary education. forefront of their field of study.
- CB2 - Students are able to apply their knowledge to their work or vocation in a professional manner and possess the competences usually demonstrated through the development and defense of arguments and problem solving within their field of study.
- CB3 - Students have the ability to collect and interpret relevant data (normally within their area of study) to make judgments that include a reflection on relevant issues of a social, scientific or ethical nature.
- CB4 - Students can transmit information, ideas, problems and solutions to both a specialized and non-specialized public.
- CB5 - Students have developed those learning skills necessary to undertake further studies with a high degree of autonomy.

Cross-curricular competencies:

- CT2 - Autonomous learning: Set of skills to select strategies for searching, analysing, evaluating and managing information from different sources, as well as to learn and put into practice what has been learnt independently.
- CT5 - Analysis and problem solving: Being able to critically evaluate information, decompose complex situations into their constituent parts, recognize patterns, and consider alternatives, approaches and perspectives in order to find optimal solutions and efficient negotiations.

Specific competencies:

- CE07: Ability to apply the technical tools used in market research and take them as a criterion in decision-making, respecting fundamental rights and equality between men and women.
- CE16: Ability to produce corporate business, competitive and communication strategies of the company to apply them to marketing actions of segmentation, positioning, growth and innovation.
- CE27: Ability to collect and process large amounts of data from different national and international databases, using new digital communication techniques.
- CE28: Ability to use Big Data tools and techniques in order to prepare reports related to the economic-business reality.

Learning outcomes:

- LO1 - Search and processing of information on economic-financial variables from different national and international databases.
- LO2 - Preparation of descriptive analyses of data and reports related to the economic and business reality.
- LO3 - Searching and processing of large amounts of data from different national and international databases.

The table below shows the relationship between the skills developed in the subject and the learning outcomes pursued:

Competencies	Learning outcomes
CB1, CB2, CB3, CB4, CB5, CT2, CT5, CE7	RA1 Search and processing of information on economic-financial variables from different national and international databases.
CB1, CB2, CB3, CB4, CB5, CT2, CT5, CE7, CE16	RA2 Preparation of descriptive analyses of data and reports relating to the economic and business reality.
CB1, CB2, CB3, CB4, CB5, CT2, CT5, CE7, CE27, CE28	RA3 Searching and processing of large amounts of data from different national and international databases.

4. CONTENT

Statistics Content:

UNIT 1: Introduction to statistics

1. The scale of measurement of the variables
2. Univariate descriptive analysis. Sampling statistics: Percentages, Measures of Central Tendency, Position, Variability and Shape.
3. Graphical representation
4. Index numbers and measures of concentration

UNIT 2: Bivariate descriptive analysis

1. Qualitative - qualitative.
2. Qualitative - quantitative.
3. Quantitative - quantitative.

UNIT 3: Statistical Inference

1. Main continuous probability distributions. The Normal distribution.
2. Sampling
3. Contrast of means. Student's t-test
4. Bivariate correlation
5. Simple linear regression

Big Data Content:

UNIT 1: Basic concepts of Big Data.

1. The rise of data and its importance in business
2. The DIKW model
3. The four Vs
4. Data analysis

UNIT 2: Big Data in the enterprise.

1. The Big Data strategy
2. The data driven enterprise
3. Professional profiles
4. Data governance

UNIT 3: Data monitoring and analytics

1. Data Scraping
2. Open Datasets
3. Data formats: TSV, CSV, XML, JSON
4. Data organisation and filtering
5. Spreadsheet work in the cloud
6. Introduction to Python with Google Colab and Jupyter Notebooks
7. Data representation with Gephy
8. AI and data processing

UNIT 4: Big Data and Online Marketing

1. Introduction to Business Intelligence
2. Information systems and their types
3. Business Intelligence: definition and characteristics
4. Market segmentation and Big Data
5. Google Analytics

5. TEACHING-LEARNING METHODOLOGIES

The types of teaching-learning methodologies used are indicated below:

- Master class
- Case method
- Cooperative learning
- Problem-based learning
- Project-based learning

6. LEARNING ACTIVITIES

Listed below are the types of learning activities and the number of hours the student will spend on each one:

Campus-based mode:

Learning activity	Number of hours
LA1 Tutoring	10
LA2 Master class	35
LA3 Asynchronous master classes	10
LA4 Autonomous work	40
LA5 Oral presentations	7
LA6 Case analysis and problem solving	25
LA7 Participatory group activities	20
LA8 Knowledge tests	3
TOTAL	**150**

7. ASSESSMENT

Listed below are the assessment systems used and the weight each one carries towards the final course grade:

Campus-based mode:

Statistical evaluation system	Weight
Knowledge tests	40%
Oral presentations	30%
Case analysis and problem solving	20%
Performance monitoring	10%

Big Data evaluation system	Weight
Knowledge tests	50%
Oral presentations	20%
Case analysis and problem solving	20%
Performance monitoring	10%

In the observation of performance, the following are assessed:

- Class attendance
- Active participation in class
- Completion of non-assessable exercises

On the Virtual Campus, when you access the course, you will be able to consult in detail the assessment activities to be carried out, as well as the delivery dates and the assessment procedures for each one of them.

7.1. First exam period

In order to pass the course in the ordinary exam, you must obtain a grade higher or equal to 5.0 out of 10.0 in the final grade (weighted average) of the course 50 % Statistics and 50 % Big Data.

In each of the two modules (Statistics and Big Data), a mark of ≥ 5 points out of 10 must be achieved in the knowledge tests. If the student obtains a mark <5 points out of 10 in any of the assessable parts, the rest of the assessable content will not be averaged.

IMPORTANT: To take the first exam period, students must reach (at least) an attendance of 50% in face-to-face sessions.
In case the attendance is below 50%, the student will directly go to the second exam period.

7.2. Second exam period

The student must take the exam for the knowledge test failed in the Statistics module and/or the Big Data module. Again, the student must get a score ≥ 5 points out of 10 in the test.

The activities not passed in the ordinary exam must be handed in, after having received the corresponding corrections from the teacher, or those that were not handed in. These activities will evaluate the same contents as in the ordinary exam, but may be different from those of the ordinary exam.
The performance mark is an assessment evaluated exclusively during the teaching period. Therefore, Performance cannot be assessed in extraordinary period.

8. SCHEDULE

In this section you will find the timetable with dates for the delivery of evaluable activities of the subject:

Assessable activities Statistics	Deadline
Activity 1. Descriptive analysis of qualitative variables	Week 2
Activity 2. Descriptive analysis of quantitative variables	Week 4
Activity 3. Bivariate descriptive analysis between two qualitative variables.	Week 7
Activity 4. Bivariate descriptive analysis between a quantitative and a qualitative variable.	Week 9
Activity 5. Bivariate descriptive analysis between two quantitative variables and simple linear regression	Week 11
Activity 6. Final task	Week 13

Assessable activities Big Data	Deadline
Activity 1. Big Data and business case study	Week 2
Activity 2. Data Scraping Exercise	Week 4
Activity 3. Data Formats Exercise	Week 6
Activity 4. Python exercise (Jupyter Notebooks with Google Colab) + IA	Week 7
Activity 5. Exercise downloading data from Youtube and Sentiment Analysis	Week 8
Activity 6. Exercise visual representation of cluster maps	Week 9
Activity 7. GA4 Certificate (Google Analytics)	Week 13

This schedule may be subject to changes for logistical reasons relating to the activities. The student will be notified of any change as and when appropriate.

9. BIBLIOGRAPHY

The reference work for the follow-up of the subject is:

- J. Esteban García et al.; Estadística Descriptiva y nociones de probabilidad. Ed Paraninfo, 2011.
- B. Marr; Big Data. Using Smart Big Data, Analytics and Metrics to Make Better Decisions and Improve Performance. Ed. Willey, 2015.

Recommended bibliography is given below:

- J. Hernández Alonso, L. López Morán; Estadística Descriptiva. Ediciones Académicas, 2009.
- M. Spiegel, J. Schiller, R. Srinivasan; Probability and Statistics. Ed. Mc Graw-Hill, 2014.

- L. Ruiz-Maya Pérez, J. Martín-Pliego López; Fundamentos de Inferencia Estadística. Ed. Paraninfo, 2005.
- M.A. Gómez Villegas; Inferencia Estadística. Ed. Díaz de Santos, 2013.
- W. Ammermand; The Invisible Brand, Marketing in the Age of Automation, Big Data and Machine Learning. Ed. Willey, 2019.
- R. Glass & S. Callahan; The Big Data-Driven Business. Ed. Willey, 2015
- Gonzalez; Big Data for CEOs and Marketing Directors. Ed. IGD, 2017.

A wide variety of academic articles will be recommended during classes to support this basic bibliography.

10. EDUCATIONAL GUIDANCE, DIVERTISITY AND INCLUSION UNIT

From the Educational Guidance, Diversity and Inclusion Unit (ODI) we offer support to our students throughout their university life to help them reach their academic achievements. Other main actions are the student's inclusions with specific educational needs, universal accessibility on the different campuses of the university and equal opportunities.

From this unit we offer to our students:

1. Accompaniment and follow-up by means of counselling and personalized plans for students who need to improve their academic performance.
2. In terms of attention to diversity, non-significant curricular adjustments are made in terms of methodology and assessment for those students with specific educational needs, pursuing equal opportunities for all students.
3. We offer students different extracurricular resources to develop different competences that will encourage their personal and professional development.
4. Vocational guidance through the provision of tools and counselling to students with vocational doubts or who believe they have made a mistake in their choice of degree.

Students in need of educational support can write to us at:
orientacioneducativa.uev@universidadeuropea.es

11. ONLINE SURVEYS

Your opinion matters!

The Universidad Europea encourages you to participate in several surveys which help identify the strengths and areas we need to improve regarding professors, degree programs and the teaching-learning process.

The surveys will be made available in the "surveys" section in virtual campus or via e-mail.

Your assessment is necessary for us to improve.

Thank you very much for your participation.

PLAGIARISM REGULATION

- Plagiarism, either wholly or in part of an intellectual property, will be considered as a serious misconduct.
- The use of fraudulent or illicit means to pass the subject will be reflected in the academic record of the student as a serious fault. This will lead to fail the subject in the corresponding exam period.
- In the case of suspicion of inappropriate use of Artificial Intelligence technologies, the teacher reserves the right to ask the student to defend the activity orally. If the student cannot defend it sufficiently, the activity will be graded with a score of 0.