Universidad de Navarra

Sports Data Analytics

Teaching guide 2026-27

INTRODUCTION

Course description: In this course you will learn everything that has to do with the phenomenon of Sports Analytics. Nowadays, data has arrived to sports and is more and more present in everyday life to make faster, more effective and less risky decisions. Uncertainty and chaos reign in sports such as soccer and, therefore, it is important to imbue some order in the work processes and go to the best sources of information such as data providers. Collecting the information is only the beginning, because afterwards there must be a method of cleaning and processing it to be able to visualize it. Visualization is the most striking and impactful part. Today, it is a fundamental part of data analysis and helps to build the best possible reports. During the course we will study the basics of programming languages in order to have an approach to these analysis techniques and we will teach how to build dynamic dashboards that help to make effective decisions. Finally, we will talk about artificial intelligence and how it can intervene positively in sports.

- **Degrees**: Degree in Economics, Degree in Business administration, Double degree in Economics + Law, Double degree in Business administration + Law
- **Module in the Degree Program**: Módulo 7: Optativas/Electives. Materia 7.1: Optativas Generales/General Electives
- **ECTS**: 3 ECTS
- **Year**: 3rd-4th (Degree in Economics, Degree in Business administration), 5th (Double degree in Economics + Law, Double degree in Business administration + Law)
- **Semester**: 1st
- **Type of course**: Elective
- **Instructor**: Pablo Sanzol
- **Language**: English
- **Department**: Economics, School of Economics and Business
- **Schedule of lectures**: https://www.unav.edu/web/facultad-de-ciencias-economicas-y-empresariales/estudiantes/horarios

LEARNING OUTCOMES

In this course there is a number of competences that the student will work on:

Basic Competencies

BC2. Students should be able to apply their knowledge to their job or vocation in a professional way. They should be able to prove their general competencies by developing and defending arguments and solving problems within their subject area.

BC3. Students must have the ability to gather and interpret relevant data (usually within their area of study) to make judgments that include a reflection on relevant social, scientific and ethical topics.

BC4. Students must be able to transmit information, ideas, problems and solutions to specialized and general audiences.

General Competencies

GC2. To identify, integrate and use the knowledge acquired to argue, discuss and solve relevant problems in economics and/or business.

GC3. To prepare professional reports and/or multimedia presentations on topics related to economics and/or business.

GC5. To communicate results and analysis either orally or in writing that are useful to economics and business.

GC8. To develop expectations, describe scenarios and make estimates using relevant information for the company.

Specific Competencies for Elective Subjects

CEO12. Understand basic programming concepts.

CEO13. Understand basic tools, such as data visualization, for business communication and decision-making.

PROGRAM

Chapter 1. Big Data and sports.

- The history of Big Data.

- The data analyst.

- The origin of Big Data in sports.

- The process of information processing.

- Real cases of success.

Chapter 2. Data providers.

- The main sports data providers.

- The open data ecosystem and Open Data platforms.

Chapter 3. The unit of measurement: the metric.

- Metrics and variables in sport as a unit of measurement.

- Metrics and performance indicators.

- Advanced metrics: definition, construction and utility.

- Real cases of study.

Chapter 4. Fundamentals of programming languages.

- Fundamentals of R: definition and case studies.

- Python fundamentals: definition and case studies.

- Performance detection from programming.

Chapter 5. Business Intelligence visualization tools.

- Visualization of sports data.

- Fundamentals of Tableau.

- Case studies: creation of dashboards and presentation of reports.

Chapter 6. Artificial Intelligence.

- State of the art of Artificial Intelligence in sports.

- Machine Learning model design methodology.

- Probabilistic theoretical basis.

- Complete development of a sports and/or corporate Artificial Intelligence project.

EDUCATIONAL ACTIVITIES

a) Lectures.

The course will be taught in one weekly session, each of them with 45 minutes.

The dynamics of the course will have a predominant applied focus by analysing and discussing the hottest topics in sports operations. Students are expected to attend lectures regularly and participate in the debates and discussions fostered by the lecturer.

There's a grade (which is worth 25% of the final grade for active classroom participation **(not the mere attendance)** including students' questions and responses to professor's open questions, comments, discussions and participation in debates.

b) Office hours.

The lecturer will be available, at the announced time, to solve questions regarding the course both individually and in small groups.

c) Personal study.

It is essential, in order to follow the explanations properly, to regularly study the lessons, as the course advances in a progressive way on the previously explained material.

The lecturer will upload some readings that students should prepare previous to the debates.

d) Exams.

There is a mid-term exam on November, which is worth 25% of the final grade and a final exam in the December exam period, which worth 50% of the final grade.

Mid-term exam:

• Includes questions of chapters 1-3

• The exam has two parts:

• The first part is a multiple-choice test with 20 questions regarding the topics of chapters 1-3, each with four choices and one valid answer. Each correct answer adds one point and each incorrect answer deducts one quarter of a point. This part is worth 80% of the exam grade.

• The second part consists of an open question regarding the topics of chapters 1-3. This part is worth 20% of the exam grade.

• Students who obtain a grade of 6 or more are exempt from answering questions of chapters 1-3 in the final exam

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Final exam (December exam period) for those students who obtained a grade of 6 or more in the mid-term exam:

• Includes questions of chapters 4-6

• The exam has two parts:

• The first part is a multiple-choice test with 15 questions regarding the topics of chapters 4-6, each with four choices and one valid answer. Each correct answer adds one point and each incorrect answer deducts one quarter of a point. This part is worth 60% of the exam grade

• The second part consists of two open questions regarding the topics of chapters 4-6. This part is worth 40% of the exam grade.

Final exam (December exam period) for those students who obtained a grade lower than 6 in the mid-term exam:

• Includes questions of chapters 1-6

• The exam has two parts:

• The first part is a multiple-choice test with 20 questions regarding the topics of chapters 1-6, each with four choices and one valid answer. Each correct answer adds one point and each incorrect answer deducts one quarter of a point. This part is worth 60% of the exam grade

• The second part consists of an open question regarding the topics of chapters 1-3 and an open question regarding the topics of chapters chapters 4-6.

This part is worth 40% of the exam grade.

ASSESSMENT

ORDINARY ASSESSMENT

- Active classroom participation and cases of study: 25%.
- Mid-term exam (October): 25%.
- Final exam (December exam period): 50%.*

EXTRAORDINARY ASSESSMENT

- Active classroom participation and cases of study: 15%.**
- Extraordinary exam (June exam period): 85%.*

*A minimum of 4 in the final/extraordinary exam is required to pass the course.

**These grades are those obtained during the ordinary period of lectures (September-November) and there are no extra assignments to change those grades once the period of lectures is over.

HONESTY IS THE BEST POLICY

(Ethics Committee Provisions Against Plagiarism and Copying)

We value honesty. Without it, there can be no trust or any meaningful social relations. Therefore, the School expects honesty and fairness from all of its members: professors, non-academic staff, and students.

Dishonest behaviours will be sanctioned in accordance with the University Norms on Student Academic Discipline of August 2015, and include lying, cheating in exams, and plagiarism in written work. We take such violations seriously. Depending on their gravity, these offences will be

dealt with by the Professor in charge of the subject, by the Dean of Students, and in very severe cases, by the Vice President for Student Affairs.

Sanctions include:

- formal warnings
- prohibition from entering University premises for a given period
- loss of admission rights to exams
- loss of scholarships
- A failing grade for the piece of work or the whole course

OFFICE HOURS

The timetable of office hours is:

- Mondays, 10.00-12.00

The venue is Office 2300 in Edificio Amigos, sector hilera.

- As professors have many tasks, it is likely that, if you don't previously book an appointment, you may not find the professor in the office even during office hours. So, **you should always send an e-mail in advance to psanzol@external.unav.es to book an appointment.**

BIBLIOGRAPHY AND RESOURCES

The lecturer uses **slides in the lectures as an auxiliary material for the explanations and publishes them in the ADI page**, but the knowledge required will never be restricted to the content of the slides. The lecturer expects the student to learn everything which is explained in the lectures.