

**COURSE DATA****Data Subject**

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|----------------------|-----------------|
| Code | 44655 |
| Name | Web analytics |
| Cycle | Master's degree |
| ECTS Credits | 3.0 |
| Academic year | 2023 - 2024 |

Study (s)

| Degree | Center | Acad. year | Period |
|--|-----------------------|-------------------|---------------|
| 2221 - Master's Degree in Data Science | School of Engineering | 1 | Second term |

Subject-matter

| Degree | Subject-matter | Character |
|--|-----------------------|------------------|
| 2221 - Master's Degree in Data Science | 7 - Web analytics | Obligatory |

Coordination

| Name | Department |
|----------------------------------|------------------------------|
| MAGDALENA BENEDICTO, JOSE RAFAEL | 242 - Electronic Engineering |
| SORIA OLIVAS, EMILIO | 242 - Electronic Engineering |
| VILA FRANCES, JOAN | 242 - Electronic Engineering |

SUMMARY

The aim of the subject is to introduce students to the field of Web Analytics and develop some of the main tools that data scientists use in the development of their functions.

After giving an introduction to web analytics, the foundations of this field of knowledge is established and KPI (Key Performance Indicators) will be defined. Then students will work with a free web analytics tool (Google Analytics) to apply the learned concepts and their application to web page management.

Some web analytics tools perform the process known as Data Engineering automatically, but not always, will be interested in these standard data, so it will require some tools to capture and collect information, data cleaning and transform them through automated processes.



The data scientist must, in many occasions, design experiments to properly assess the impact of the changes introduced on websites of their organization, so it will be necessary to know what types of experiments and in which conditions should be made.

Another relevant issue in web analytics are the recommender systems that are used to increase the use or sale of products. The students will learn and apply collaborative filtering systems and the kNN algorithm for recommenders.

The course will conclude with text mining and sentiment analysis, which intend to know the opinion of users about a product or service through the information available on social networks and the Internet in general.

For the development of the subject, different tools, like R. will be used

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

COMPETENCES (RD 1393/2007) // LEARNING OUTCOMES (RD 822/2021)

2221 - Master's Degree in Data Science

- Students should communicate conclusions and underlying knowledge clearly and unambiguously to both specialized and non-specialized audiences.
- Students should demonstrate self-directed learning skills for continued academic growth.
- Students should possess and understand foundational knowledge that enables original thinking and research in the field.
- Be able to assess the need to complete their technical, scientific, language, computer, literary, ethical, social and human education, and to organise their own learning with a high degree of autonomy.
- Capacidad de análisis y síntesis, en la elaboración de informes, en la exposición, comunicación y defensa de ideas.
- Ser capaces de asumir la responsabilidad de su propio desarrollo profesional y de su especialización en uno o más campos de estudio, aplicando los conocimientos adquiridos en la identificación de salidas profesionales y yacimientos de empleo.
- Extraer conocimiento de conjuntos de datos en diferentes formatos.
- Analizar datos procedentes de la Web extrayendo conocimiento útil de ellos mediante la aplicación de técnicas de análisis de datos.



LEARNING OUTCOMES (RD 1393/2007) // NO CONTENT (RD 822/2021)

Understand the technical basis of web analytics and its main application tools

Provide students with knowledge of the main techniques for data engineering (capture, cleaning and processing of information) .

Provide students with a basis to develop web analytics experiments without the standard tools for web analytics.

Understand and implement the main recommendation systems and can adapt to the needs of the company or organization.

Provide students with knowledge of text mining for use in web analytics

Process text for further analysis of the feelings of the user.

DESCRIPTION OF CONTENTS

1. Introduction to web analytics and data scrapping

Introduction to web analytics, definition and use of different tools for data scrapping.

2. Data collection through APIs. Web scraping

Use of some enterprise or institucional APIs (Application Programming Interfaces) for data scrapping. Description of the most widespread web scraping techniques

3. Web analysis and A/B test tools

Use of a free web analytics tool (e.g. Google Analytics). Definition and use of KPI (Key Performance Indicators) and the Test A/B.

4. Recommender Systems

Presentation of the different recommender systems and its current applications.

5. Text Mining and Sentiment Analysis

Text mining and its application to social networks. Sentiment analysis through the internet

**WORKLOAD**

| ACTIVITY | Hours | % To be attended |
|--|--------------|------------------|
| Theoretical and practical classes | 30,00 | 100 |
| Development of individual work | 6,00 | 0 |
| Study and independent work | 4,00 | 0 |
| Readings supplementary material | 3,00 | 0 |
| Preparation of evaluation activities | 6,00 | 0 |
| Preparing lectures | 8,00 | 0 |
| Preparation of practical classes and problem | 9,00 | 0 |
| Resolution of case studies | 9,00 | 0 |
| TOTAL | 75,00 | |

TEACHING METHODOLOGY

The course will combine the theoretical and the practical part, without separating sessions devoted to theory from those devoted to practice. The lessons will be taught in a computer equipped classroom.

In the theoretical part of the classes, the teacher will introduce the concepts and methods, with examples and exercises to be solved by the students.

The practical sessions will be synchronized with the theory. In these sessions, the students will learn by solving problems, exercises and case studies, in order to acquire the skills of this course.

EVALUATION

English version is not available

REFERENCES**Basic**

- Aggarwal, C. (2016). Recommender Systems. The Textbook. Ed. Springer, New York
- Chan, Y., Talburt, J., Talley, T.M. (2010). Data Engineering. Mining, Information and Intelligence. Ed. Springer, New York
- Munzert, S. (2015) Automated Data Collection with R: A Practical Guide to Web Scraping and Text Mining. Ed. Wiley & Sons, New York.



- Zhai, C. y Massung, S. (2016) Text Data Management and Analysis: A Practical Introduction to Information Retrieval and Text Mining. Ed. ACM Books, Virginia.
- Practical Web Scraping for Data Science: Best Practices and Examples with Python (2018). Seppe vanden Broucke, Bart Baesens, Apress.
- Website Scraping with Python Using BeautifulSoup and Scrapy (2018) Hajba, Gábor, Apress.

Additional

- Croll, A. y Yoskovitz, B. (2014). Lean Analytics. Como utilizar los datos para crear más rápido una startup major. Universidad Internacional de La Rioja, S.A., Logroño
- Provost, F. y Fawcett, T. (2013). Data Science for Business: What you need to know about data mining and data-analytic thinking. Ed. O'Reilly Media
- Beasley, M. (2013) Practical Web Analytics for User Experience: How Analytics Can Help You Understand Your Users. Ed. Elsevier, New York