Subject

Digital Industry I

Year: 3   **Credits**: 3 ECTS   **Language**: Spanish

Competencies

Core competences:

CB1. Students have demonstrated knowledge and understanding in an area of study that builds on the foundation of general secondary education and is usually at a level that, while relying on advanced textbooks, also includes certain elements involving cutting-edge knowledge in their field of study

General competences:

CG2. Curiosity and empathy

Specific competences:

CE1. Understand, know and apply the theories, tools and processes for capturing data sources from different types of data sources and for data warehousing.

CE5. Have and demonstrate a very deep insight into the areas of organisational management, thereby understanding the implications of data management in the various organisational domains.

Learning outcomes

RA2. Ability to ask questions, and to empathise with the problems and concerns of the people around them. This ability to listen enables the person to detect opportunities and identify the problems to be solved.

RA7. Understand, know and apply the theories, tools and processes for capturing data sources of a different type.

RA12. Have and demonstrate a very deep insight into the areas of organisational management, thereby understanding the implications of data management in the various organisational domains.

Syllabus

Introduction to Industry 4.0
- Machining sector
- Aeronautical sectors
- Wind energy sector
- Railway sector

The importance of using intelligent algorithms for process improvement
- Case study
- Basic understanding of machining
- Machining process modelling
- Industrial/scientific variables and the effect of the process on these variables
- Set-up and assembly, sensors and synchronised signal acquisition and measurement of industrial parameters

Feature extraction
- Time domain
- Frequency domain
- Identification of process-relevant characteristics

Process monitoring
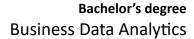- Conventional process monitoring
- Intelligent process monitoring

Training activities

The training activities planned for this module are the following:

- Challenge-based learning (2 ECTS)
- Teamwork (0.25 ECTS)
- Case methodology (0.75 ECTS)

Assessment system

Assessment will be by means of the continuous assessment system, providing constant

feedback to both teachers and students on the learning process throughout the academic period:

- Learning activities involving the presentation of knowledge and individual study may be assessed by means of oral and/or written tests, which will account for a maximum of 60% of the final mark.
- The training activities aimed at acquiring the practical skills of the subjects will be assessed through the completion of various activities (assignments, case studies, challenges, etc.) accounting for at least 40% of the final mark.

Details of the assessment and marking will be made explicit in the annual academic planning of the subjects, in accordance with the teachers responsible and the determining factors of each course.

Bibliography

- Kanagachidambaresan, G. R., Anand, R., Balasubramanian, E., & Mahima, V. (2020). Internet of Things for Industry 4.0 Design, Challenges and Solutions. https://doi.org/https://doi.org/10.1007/978-3-030-32530-5
- Teti, R., Jemielniak, K., O'Donnell, G., & Dornfeld, D. (2010). Advanced monitoring of machining operations. CIRP Annals - Manufacturing Technology, 59(2), 717– 739. https://doi.org/10.1016/j.cirp.2010.05.010
- Byrne, G., Dornfeld, D., Inasaki, I., Ketteler, G., König, W., & Teti, R. (1995). Tool Condition Monitoring (TCM) - The Status of Research and Industrial Application. CIRP Annals - Manufacturing Technology, 44(2), 541– 567.https://doi.org/10.1016/S0007-8506(07)60503-4