COURSE DATA

DATA SUBJECT

Code: 46545
Name: Data-Based Continuous Improvement Techniques
Cycle: Master's Degree
ECTS Credits: 4
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
2260 - Master's degree in Quality Management	Facultat d'Economia	1	Annual

SUBJECT-MATTER

Degree	Subject-matter	Character
2260 - Master's degree in Quality Management	Herramientas, técnicas y programas de gestión de la calidad	COMPULSORY

COORDINATION

LOPEZ RODRIGUEZ M ISABEL

SUMMARY

The objective of the subject **Continuous Improvement Techniques Based on Data** is that the student learns and applies statistical techniques that allow detecting the factors that influence the correct development of business processes, thus allowing them to be improved. To this end, we will use techniques that fit, fundamentally, to two types of scenarios, derived from the possibility of accessing or not to the data related to the process: multivariate techniques, and design of experiments and Taguchi methods. Likewise, the student must be able to apply, in an effective way, these techniques, adapting them according to the situation or the real problem to be addressed.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

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

OTHER REQUIREMENTS

The knowledge required to take this course is the same as that required for admission to this master's degree, and it is advisable to have passed the course "Tools for quality assessment".

COMPETENCES / LEARNING OUTCOMES

2260 - Master's degree in Quality Management

Collaborate effectively in work teams, assuming responsibilities and leadership roles and contributing to collective improvement and development.

Demonstrate critical and self-critical reasoning within the field of study, considering aspects such as professional ethics, moral values and the social implications of the different activities carried out.

Demonstrate knowledge and understanding of social inequalities based on sex and gender within this specific field of study; integrate the different needs and preferences based on sex and gender into the design of solutions and problem solving.

Know the main technical tools and quality management programmes.

Lead teams and empower them.

Make strategic, tactical or operational decisions in the field of quality management.

Promote commitment to quality in all departments and at all hierarchical levels of the organisation.

Propose creative and innovative solutions to complex situations or problems specific to the field of knowledge to respond to different professional and social needs.

Use tools to assess and control quality as well as different continuous improvement techniques.

DESCRIPTION OF CONTENTS

1. Introduction to experimental analysis. Statistical inference

Definition of what is meant by experimental analysis. Description of the statistics necessary for the identification of influential factors in business processes.

2. Comparison of means

Description and application of techniques for comparing the means of two populations.

3. Single-factor experiment

Description and application of techniques for analyzing the influence of one factor on business processes.

4. Experiment with more than one factor

Description and application of techniques for analyzing the influence of more than one factor on business processes.

5. Factorial design and introduction to Taguchi designs

Description and application of factorial designs that allow detecting the significant effects of two or more factors in business processes.

6. Multivariate techniques

Description and application of multivariate techniques that allow proposing an improvement of the process, based on the existing process data.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	40,00
Total hours	**40,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	10,00
Independent study and work	60,00
Preparation of lessons	10,00
Preparation for assessment activities	20,00
Resolution of case studies	0,00
Total hours	**100,00**

TEACHING METHODOLOGY

Each session will be developed interactively (MD1) so that, using the material provided by the teacher, after the exposition of the corresponding topic, the rest of the class will be devoted to the following tasks:

- The realization by the students of theoretical-practical cases related to the exposed topic (MD3, MD4, MD6, MD11).

- The clarification of the concepts that have presented problems in their application (MD1).

MD1- Theoretical classes - Participative master classes

MD3- Practical cases

MD4- Problems

MD6- Project development (real application of the methodologies learned)

MD11- Working group

For the processing of information through the use of Generative Artificial Intelligence (GAI) tools, the following considerations must be taken into account:
¿ As a general rule, GAI tools may not be used to achieve the main objective of assessment activities
¿ Teachers will explicitly indicate under what conditions and for what type of activities the use of GAI is permitted or restricted.
¿ If the student uses any GAI tools, they must indicate this in the work submitted. They will include a footnote or an appendix containing the prompt used, its various modifications and a fragment of the most relevant text from the response.

EVALUATION

The evaluation of the course will be carried out by means of:

- The evaluation of the student's participation in the different sessions (10%).

- The realization and defense of a group work (s), in which the contents taught throughout the course will be applied (30%).

- The evaluation of the written test(s) and/or individual work (60%).

In no case may less than 50% be obtained in each of the following sections: "The realization and defense of a (s) work (s) in group, in which the contents taught throughout the course will be applied" and "the assessment of the

REFERENCES

BASIC

- Kuehl, R. O. (2001). Diseño de Experimentos: principios estadísticos para el diseño y análisis de investigaciones. Thomson Learning
- Montgomery,D.C. (2011).Diseño y Análisis de experimentos. Ed. Limusa-Wiley
- Pérez López, C. (2013). Diseño de experimentos: técnicas y herramientas, Ed. Garceta
- Pérez Marqués, M. (2014): Minería de datos a través de ejemplos. Ed. RC Libros
- Sánchez Carrión, J.J. (1999). Manual de Análisis Estadístico de los Datos. Ed. Alianza.

COMPLEMETARY

- CEACES, Proyecto (Contenedor Hipermedia de Estadística Aplicada a las Ciencias Económicas y Sociales). Universitat de València. ON LINE: http://www.uv.es/ceaces
- Escuder, R y Murgui, S. (1995). Estadística Aplicada. Economía y Ciencias Sociales. Valencia: Tirant lo Blanch.
- Esteban García et. al (2018). Inferencia estadística. Ed Garceta - García, R.M. (2010). Inferencia Estadística y Diseño de Experimentos. Universidad de Buenos Aires.
- Montgomery, D. C.; Runger, G.C. (2012). Probabilidad y Estadística aplicadas a la ingeniería. Ed. Limusa-Wiley.
- Peña, D. (2010). Regresión y Diseño de Experimentos. Alianza Editorial.
- Pérez López, C. (2013). Análisis multivariante de datos: aplicaciones con IBM SPSS, SAS y STATGRAPHICS. Ed. Garceta
- Uriel Jiménez, E.; Aldás Manzano, J. (2005). Análisis multivariante aplicado: aplicaciones al marketing, investigación de mercados, economía, dirección de empresas y turismo. Thomson, D. L. Madrid.

Vicente, L.; Girón, P.; Nieto, C.; Pérez, T. (2005). Diseño de experimentos: soluciones con SAS y SPSS. Ed. Pearson Educación