
Academic Year: (2024 / 2025)**Review date: 30-04-2024**

Department assigned to the subject: Statistics Department**Coordinating teacher: GUERRERO LOZANO, VANESA****Type: Electives ECTS Credits : 6.0****Year : Semester :**

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Statistics I and II

OBJECTIVES

1. Describe the basis of the methods of quality control and the basic tools for the analysis of processes.
2. Estimate the capacity of a productive process from production data.
3. Construct a quality control plot for proportions, ranges and means.
4. Inspection plans.
5. Learn how to use specific software.

1. Analysis and synthesis capability.
2. Team working.
3. Problem solving.
4. Oral and written communication.
5. Critical reasoning.

DESCRIPTION OF CONTENTS: PROGRAMME

1. Quality. Quality management systems.
 - 1.1 History of Quality
 - 1.2 Quality management systems.
 - 1.3 Standardisation, Accreditation and Certification.
 - 1.4 Processes management.
2. Management and improvement of quality.
 - 2.1 Organizational structure and documentary management.
 - 2.2 Planning, Establishment, Monitoring and Improvement.
3. Total Quality. EFQM model of Excellence.
 - 3.1 Preliminaries.
 - 3.2 Description.
 - 3.3 Assessment.
 - 3.4 Awards.
4. Economic aspects of quality. Quality costs.
 - 4.1 Idea.
 - 4.2 Classification.
 - 4.3 Optimal quality.
5. Quality indicators.
6. Statistical processes control.
 - 6.1 Basics of Statistics.
 - 6.2 Variability of a manufacturing process.
 - 6.3 Variable control.
 - 6.4 Attribute control.
7. Quality tools.
 - 7.1 Introduction. Ishikawa's idea.
 - 7.2 Histograms.
 - 7.3 Pareto charts.

- 7.4 Cause and Effect charts.
- 7.5 Scatter diagrams.
- 7.6 Flow charts.
- 7.7 Run charts.
- 7.8 Control charts.
- 8. Processes improvement. 6-Sigma methodology.
- 8.1 Idea.
- 8.2 6-Sigma methodology.
- 8.3 Other methods.
- 9. Receipt control
- 9.1 Introduction.
- 9.2 Sampling.
- 9.3 Tables Mil-Std-105.
- 10. Experiments design
- 10.1 Factorial design.
- 10.2 ANOVA.

LEARNING ACTIVITIES AND METHODOLOGY

- Theory (3 ECTS): Theory classes with background materials available on the web.
- Practical sessions (3 ECTS): Problem-solving sessions and computing classes using statistical software.
- Weekly individual tutoring sessions. Group tutorials are possible during the last week.

ASSESSMENT SYSTEM

% end-of-term-examination:	40
% of continuous assessment (assignments, laboratory, practicals...):	60

40% of the final grade will be obtained in a final examination of the level of acquired learning skills. The remaining 60% will be the result of a continued assessment of the students' understanding both of the theoretical contents of the course and their ability to apply them to the solution of practical problems.

BASIC BIBLIOGRAPHY

- GOETSCH, D.L. and DAVIS, S.B. "Quality Management. Introduction to total quality management for production, processing, and services", Prentice-Hall, 2000
- ISHIKAWA, K. "Guide to Quality Control", Asian Productivity Organization, 1991
- ISHIKAWA, K. "What is Total Quality Control? The Japanese way", Prentice-Hall, 1995
- MONTGOMERY, D.C. "Introduction to Statistical Quality Control", John Wiley & Sons., 2009
- MONTGOMERY, D.C. "Design and Analysis of Experiments", John Wiley & Sons, 2004