

Academic Year: (2023 / 2024)

Review date: 28-04-2023

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.
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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

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.

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

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