

Course Unit	Quality Management		Field of study	Management	
Bachelor in	Industrial Management and Engineering		School	School of Technology and Management	
Academic Year	2022/2023	Year of study	3	Level	1-3
Type	Semestral	Semester	2	ECTS credits	6.0
Code	9104-754-3201-00-22				
Workload (hours)	162	Contact hours	T -	TP 60	PL -
			TC -	S -	E -
			OT -	O -	

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) António Jorge da Silva Trindade Duarte

### Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. Quality assurance: to guide a certification process of a quality system based on the ISO 9000: 2000 standards.
2. Quality improvement: to identify the (non) quality costs in organizations and to manipulate a set of techniques for improving the quality (Ishikawa and Pareto diagrams).
3. Quality in design/project: to manipulate tools such as Quality Function Deployment and Failure Mode and Effect Analysis.
4. Quality in purchasing: to define and to implement monitoring and inspection plans in quality.
5. Quality in production: to manipulate a set of statistical process control tools (histograms, process capability indexes, control charts).

### Prerequisites

Before the course unit the learner is expected to be able to:

1. Knowledge in Statistics (descriptive, deductive and inductive).
2. Basic use of computer and electronic spreadsheets (Excel).

### Course contents

Basic concepts in quality management. Quality assurance. Quality improvement. Quality techniques. Quality in design/project. Quality in purchasing. Quality in production.

### Course contents (extended version)

1. Quality management
  - Basic concepts.
2. Quality assurance
  - Quality policy
  - Documents for assurance quality systems
  - ISO 9000 standards
  - Procedures
  - Certification of the assurance quality systems
  - Certification of environmental management systems and total quality management
3. Quality improvement
  - Quality costs: classification and evaluation
  - Quality improvement projects
  - Continuous improvement planning
  - Problem-solving methodology
  - Quality improvement techniques and tools
4. Quality techniques
  - The statistical process control (control charts, process capability indexes, ppm)
  - Gage repeatability and reproducibility
  - Kaizen principles
5. Quality in design/project
  - Design review and Quality Function Deployment (QFD)
  - Failure Mode and Effect Analysis
6. Quality in purchasing
  - Purchasing quality planning
  - Suppliers policy
  - Objective purchasing policy definition
  - costs evaluation in quality control product acceptance and inspection planning
  - sampling (simple, multiple and sequential)
7. Quality in production
  - Organization of control and inspection quality
  - Self control criteria
  - Process control and inspection layout and the dominance concept

### Recommended reading

1. De Feo, J. A. (2016). Juran's Quality Handbook: The Complete Guide to Performance Excellence (7 ed. ). New York: McGraw-Hill Education.
2. Montgomery, D. C. (2019). Introduction to Statistical Quality Control (8 ed. ). John Wiley & Sons.
3. Pinto, J. P. (2014). Pensamento Lean (6 ed. ). Edições Lidel.
4. IPQ. (2015). NP EN ISO 9000: 2015 -- Sistemas de Gestão da Qualidade -- Fundamentos e vocabulário. Caparica: IPQ -- Instituto Português da Qualidade.
5. IPQ. (2015). NP EN ISO 9001: 2015 -- Sistemas de Gestão da Qualidade -- Requisitos. Caparica: IPQ -- Instituto Português da Qualidade.

### Teaching and learning methods

The program will be taught essentially in presence sessions (PS). The subsequent work to deepen the program will be developed either in PS or in non presence sessions (NPS). The PSs include the resolution of problems and clarification of doubts. In the NPS will be given particular relevance to the applied problems which take into account the needs and interests of students.

### Assessment methods

1. Alternative 1 - (Regular, Student Worker) (Final)
  - Final Written Exam - 25%

**Assessment methods**

- Intermediate Written Test - 25%
  - Practical Work - 40%
  - Portfolio - 10% (Classroom questions and tasks.)
2. Alternative 2 - (Regular, Student Worker) (Final, Supplementary, Special)
- Final Written Exam - 100%

**Language of instruction**

1. Portuguese
2. English

**Electronic validation**

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03-03-2023	03-03-2023	10-03-2023