



ENGLISH OFFER
2019/2020

University of Minho

School of Engineering

Department of Production and Systems

PORTUGAL



Couros Campus



Azurém Campus



Gualtar Campus

UMINHO EDUCATION

Educational offer

Course Admissions

International Students

Mobility Programmes

Recognition of foreign qualifications

Support for learning

Pedagogical Innovation

Support for students

Employability

ECTS Information

Prospective students

Academic Paths

Faculty members

www.dps.uminho.pt

UMinho is one of the youngest universities of Portugal and its first degrees were created almost 45 years ago. The Production and Systems area was one of the first created at that time to support the Engineering Curricula, mainly the Production Engineering degree.

The **Department of Production and Systems** (DPS) has been growing and, at the moment, we can offer you one PhD (the oldest in Portugal) and seven Master Degrees. The DPS staff is responsible for almost two hundred curricular units in the different areas of Industrial Engineering Management.

For courses formally taught in Portuguese, there might be the possibility to have access to bibliography, course materials, tutorial support and assessment in English. There is the option to develop research/project work with supervision in English or in a common language between the student and the tutor. From 2018/19 the DPS also offers several courses in english.

Students can follow course units mainly from the following degrees and there are some specific study areas with lectures offered in English:

- **Industrial Management and Engineering** (Integrated Master's)
- **Engineering and Quality Management** (Master's)
- **Engineering Project Management** (Master's)
- **Industrial Engineering** (Master's)
- **Human Engineering** (Master's)
- **Systems Engineering** (Master's)
- **Industrial and Systems Engineering** (Doctoral Program)

Students Organizations

ESN Minho
NEEGIUM
ESTIEM

International Relations Office

incoming@sri.uminho.pt
outgoing@sri.uminho.pt
sri@sri.uminho.pt

Erasmus Office, DPS

Prof. Senhorinha Teixeira, st@dps.uminho.pt
Academic Coordinator
Carla Rocha, carla@dps.uminho.pt
Secretary



Jorge Cunha
Assistant Professor
Director of the Master of
Industrial Engineering

Economics for Engineering (5 ECTS) T:15; TP:15

Master's in Industrial Engineering—6517

Topics of economics: supply and demand, determinants, equilibrium, elasticity, theory of production, market structures. Economic selection of alternatives: financial mathematics, equipment selection, investment appraisal. Cost accounting and management: fundamentals on costs, classification, production costs, cost volume-profits analysis, joint costs, work in progress, costing systems, cost management practices.



Néilson Costa
Assistant Professor

Ergonomics and Occupational Health and Safety (5 ECTS) T:22,5; TP:15

Master's in Industrial Engineering—6515

Introduction to Ergonomics. Approach to ergonomic workstations. Occupational biomechanics. Quantification of risk associated with conducting activities handling of loads. Physical work environment. Exposure to noise. Exposure to extreme thermal environments. Thermal comfort. Characterization of lighting conditions. Identification, definition and selection of measures of collective and individual protection. Chemical contaminants. Concept of work accident. Statistics of industrial accidents. Risk analysis. Applicable legislation. Organization of activities of Safety and Occupational Health.



Lino Costa
Associate Professor

Experimental Statistics and Operational Research (7,5 ECTS) T:30; LP:22,5

Master's in Industrial Engineering—6513

Introduction. Descriptive Statistics. Probability and probability distributions. Confidence Intervals and Hypothesis Testing. Contingency Tables. Analysis of Variance. Regression and Correlation. Non Parametric Statistics.



Filipe Alvelos
Associate Professor

Introduction to Operational Research. Linear and integer programming models for optimization problems. Exact solution methods: simplex, branch-and-bound, cutting planes. Sensitivity analysis in linear programming. Introduction to constructive and local search heuristics. Applications: location, transportation and distribution, project scheduling, resources assignment, production planning. Use of software: spreadsheets.



Sameiro Carvalho
Associate Professor

Operations Management (7,5 ECTS) T:30; TP:22,5

Master's in Industrial Engineering—6514

Introduction to operations management and its general concepts. Integrated logistics. Methodologies of analysis for logistics systems. Design and redefinition of logistics systems. Distribution management. Orders management and storage. Transport management and planning.



Dinis Carvalho
Associate Professor

Introduction to production systems and production performance measures. Introduction to production planning and control: (1) Aggregate Production Planning, and (2) Master Production Scheduling. Material and capacity requirements planning. "Just-In-Time" concepts and strategies and Lean production.



Paulo Sampaio
Associate Professor
Vice-Dean of School of
Engineering,

Quality Management (5 ECTS) T:22,5; TP:15

Master's in Industrial Engineering—6516

Introduction to quality, quality function, quality costs; Motivation for quality; Management, Leadership and Teamwork, quality circles. Introduction to Total Quality Management (TQM). Basic quality tools and methodologies, Quality function deployment (QFD). Study of ISO 9000 series of standards; liability of manufacturers (EU Directive); Models of Excellence (EFQM and PEX), Statistical Process Control.

Advanced in Quality Engineering and Management (5 ECTS) T:30; TP:15



Paulo Sampaio,
Associate Professor
Vice-Dean of School of
Engineering

Integrated Master's in Industrial Management and Engineering—7608

Quality planning Motivation for quality. Management and Leadership Workshops
Quality Circles. Special control charts Short run SPC. CUSUM and EWMA charts.
Essential elements of the Taguchi approach. Introduction to experimental design.
Simple practical example of application. Concepts of Metrology.

Applied Statistics (5 ECTS) T:30; TP:30



Lino Costa
Associate Professor

Integrated Master's in Industrial Management and Engineering—7572

Population and sample. Data types and scales of measurement. Descriptive statistics.
Probability concepts. Random variables and univariate probability distributions. Expected
value. Families of probability distributions. Estimation of parameters. Confidence intervals.
Tests of hypotheses. Analysis of variance (ANOVA). Regression and correlation.
Goodness of fit tests for large samples.

Introduction to Economic Engineering (5 ECTS) T:30; TP:15



Jorge Cunha
Assistant Professor
Director of the Master of
Industrial Engineering

Integrated Master's in Industrial Management and Engineering—9691

Introductory. concepts. The model of supply and demand. Demand theory. The firm.
Supply theory. Markets and pricing.

Lean Production Systems (5 ECTS) T:15; TP:15



Dinis Carvalho
Associate Professor

Master's in Industrial Engineering | branch: Industrial Management—6524

Measuring the performance of a production system. Dynamic Production. History of
lean manufacturing. Principles of TPS. Concept of waste. The seven types of waste.
Concept of takt time and cycle time. Little's Law. Value Stream Mapping. Methodology
for Identifying Waste WIM. Production cell designs. Operating Modes and versatility in
production cells. 5S technique. Standard Work. 5 Whys technique. Kanban and pull
production. Supermarkets and logistical convoys. Reducing setup times of the
machines. Production leveling. Continuous improvement.

Logistics (5 ECTS) T:15; TP:30



Sameiro Carvalho
Associate Professor

Integrated Master's in Industrial Management and Engineering—7597

Introduction .Logistics: Introduction and planning. Logistics customer service;
Distributions systems; Location strategy; Order processing and Information Systems;
Transport planning; Storage and handling decisions. Forecasting: Introduction.
Forecasting methods.

Occupational Safety and Hygiene (5 ECTS) T:30; TP:15



Nelson Costa
Assistant Professor

Integrated Master's in Industrial Management and Engineering—7594

Introduction to Occupational Safety. Individual Protection. Fire Safety. Occupational
Hygiene.