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Quantitative models and methods in management I

SKILLS AND LEARNING OUTCOMES

CB1. Students have demonstrated possession and understanding of knowledge in an area of study that builds on the foundation of general secondary education, and is usually at a level that, while relying on advanced textbooks, also includes some aspects that involve knowledge from the cutting edge of their field of study

CB2. Students are able to apply their knowledge to their work or vocation in a professional manner and possess the competences usually demonstrated through the development and defence of arguments and problem solving within their field of study.

CB3. Students have the ability to gather and interpret relevant data (usually within their field of study) in order to make judgements which include reflection on relevant social, scientific or ethical issues.

CB5. Students will have developed the learning skills necessary to undertake further study with a high degree of autonomy.

CG1. Ability to solve problems with initiative, decision-making, creativity, critical reasoning and to communicate and transmit knowledge, skills and abilities in the field of Industrial Engineering.

CG3. Ability to design a system, component or process in the field of Industrial Technologies to meet the required specifications

CG4. Knowledge and ability to apply current legislation as well as the specifications, regulations and mandatory standards in the field of Industrial Engineering.

CG5. Adequate knowledge of the concept of company, institutional and legal framework of the company. Organisation and management of companies.

CG6. Applied knowledge of company organisation.

CG8. Knowledge and ability to apply quality principles and methods.

CG9. Knowledge and ability to apply computational and experimental tools for the analysis and quantification of Industrial Engineering problems.

RA1. Knowledge and understanding: Have basic knowledge and understanding of science, mathematics and engineering within the industrial field, as well as knowledge and understanding of Mechanics, Solid and Structural Mechanics, Thermal Engineering, Fluid Mechanics, Production Systems, Electronics and Automation, Industrial Organisation and Electrical Engineering.

RA2. Engineering Analysis: To be able to identify engineering problems within the industrial field, recognise specifications, establish different resolution methods and select the most appropriate one for their solution

RA5. Engineering Applications: To be able to apply their knowledge and understanding to solve problems and design devices or processes in the field of industrial engineering in accordance with criteria of cost, quality, safety, efficiency and respect for the environment.

OBJECTIVES

- Knowledge and understanding of Production Systems and Industrial Organization.

- Ability to identify engineering problems within the industrial field, to establish different resolution methods and to select the most appropriate one for their solution.

- Ability to apply their knowledge and understanding to solve problems and design processes in the field of Industrial Engineering in accordance with criteria of cost, quality, safety, efficiency and respect for the environment.

DESCRIPTION OF CONTENTS: PROGRAMME

Network Models
Dynamic Programming
Markov Chains
Queueing Models

Markov Decision Processes
Nonlinear Programming

LEARNING ACTIVITIES AND METHODOLOGY

Lectures, exercises and practical sessions. Face-to-face tutorials.

ASSESSMENT SYSTEM

60% Final written exam.

40 % Continuous evaluation. One partial exam will be held. Attendance to the practical sessions.

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

BASIC BIBLIOGRAPHY

- Hillier, F.S.; Lieberman, G.J Introduction to Operations Research, McGraw-Hill, 2010

ADDITIONAL BIBLIOGRAPHY

- Bazaraa, M.S.; Jarvis, J.J.; Sherali, H.D Linear Programming and Network Flows, John Wiley & Sons, 2010

- Taha, H.A Operations Research: An Introduction, Prentice Hall, 2011