

Academic Year: (2023 / 2024)

Review date: 06-04-2023

Department assigned to the subject: Mechanical Engineering Department

Coordinating teacher: RIVERA RIQUELME, FRANCISCO ANTON

Type: Compulsory ECTS Credits : 6.0

Year : 3 Semester : 2

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.

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

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.

ECRT6. Ability for the analysis, design, simulation and optimisation of processes and products.

ECRT8. Knowledge and ability for systems modelling and simulation.

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

RA3. Engineering Design: To be able to design industrial products that comply with the required specifications, collaborating with professionals in related technologies within multidisciplinary teams.

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.

RA6. Transversal Skills: To have the necessary skills for the practice of engineering in today's society.

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 design Production Systems that comply with the required constraints, collaborating with professionals in related technologies within multidisciplinary teams.
- 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.
- Skills for the practice of engineering in today's society.

DESCRIPTION OF CONTENTS: PROGRAMME

Modeling of Production Systems
Introduction to Linear Programming
The Simplex Method

Duality
Postoptimality Analysis
Integer Programming
Simulation of Production Systems

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 (assignments, 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

- Law, A.M Simulation Modeling and Analysis, McGraw-Hill, 2015

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