

Academic Year: (2024 / 2025)

Review date: 07-06-2023

Department assigned to the subject: Mechanical Engineering Department

Coordinating teacher: ISASI SANCHEZ, LUIS

Type: Compulsory ECTS Credits : 3.0

Year : 4 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Introduction to Engineering Management

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.

CB4. Students should be able to communicate information, ideas, problems and solutions to both specialist and non-specialist audiences.

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

CG1. Analyze, formulate and solve problems with initiative, decision-making, creativity, critical reasoning skills and ability to efficiently communicate and transmit knowledge, skills and abilities in the Energy Engineering field

CG5. Acquire the ability to lead and organize energy engineering project activities.

CG9. Acquire the ability to organize and plan within a company as well as in other institutions and organizations and knowing human resources management and project planning, programming and control in such sphere.

CG10. Being able to work in a multi-lingual and multidisciplinary environment

CE6 Módulo FB. Sound knowledge of the concept of company, and the institutional and legal framework of a company. Business organization and management.

CE14 Módulo CRI. Knowledge of information systems for industrial organization and direction, logistic and productive systems, and quality management systems.

CT1. Ability to communicate knowledge orally as well as in writing to a specialized and non-specialized public.

CT2. Ability to establish good interpersonal communication and to work in multidisciplinary and international teams.

CT3. Ability to organize and plan work, making appropriate decisions based on available information, gathering and interpreting relevant data to make sound judgement within the study area.

CT4. Motivation and ability to commit to lifelong autonomous learning to enable graduates to adapt to any new situation.

By the end of this content area, students will be able to have:

RA1.1 knowledge and understanding of the basic concepts about production planning and control and logistics.

RA1.4 awareness of the wider multidisciplinary context of engineering applying knowledge of mathematics, statistics, economics and other scientific fields to the analysis of business situations.

RA2.1 the ability to apply their knowledge and understanding to identify, formulate and solve problems of industrial organization using established methods;

RA2.2 the ability to apply their knowledge and understanding to analyse engineering processes and

methods;

RA3.1 the ability to apply their knowledge to develop and realise design and operation of productive and logistic systems

RA5.1 the ability to select and use appropriate tools and methods in industrial organization;

RA5.4 an awareness of the non-technical implications of engineering practice.

RA6.4 demonstrate an awareness of project management and business practices, such as risk and change management, and understand their limitations.

OBJECTIVES

By the end of this subject, students will be able to have:

1. knowledge and understanding of the basic concepts about production planning and control and logistics.
2. awareness of the wider multidisciplinary context of engineering applying knowledge of mathematics, statistics, economics and other scientific fields to the analysis of business situations.
3. the ability to apply their knowledge and understanding to identify, formulate and solve problems of industrial organization using established methods;
4. the ability to apply their knowledge and understanding to analyse engineering products, processes and methods;
5. the ability to apply their knowledge to develop and realise design and operation of productive and logistic systems;
6. the ability to select and use appropriate tools and methods in industrial organization;
7. an awareness of the non-technical implications of engineering practice;
8. demonstrate an awareness of project management and business practices, such as risk and change management, and understand their limitations;

DESCRIPTION OF CONTENTS: PROGRAMME

1. Organization of industrial firms.
 - 1.1. Introduction to operations, production and the Supply Chain.
 - 1.2. Qualitative and quantitative tools and techniques applicable in the organization of industrial firms.
2. Demand forecasting, inventory management and warehousing.
 - 2.1. Demand management.
 - 2.2. Independent demand inventory management models. Lot sizes.
 - 2.3. Warehousing. Lifecycle: reception, warehousing, picking, expedition. Information Systems.
3. Logistics and manufacturing planning and control systems. MRP.
 - 3.1. Manufacturing Planning and Control Systems (MPCS).
 - 3.2. Materials Requirements Planning (MRP). Master Schedule. Needs breakdown and anticipation.
4. Alternative approaches for coordinating production.
 - 4.1. Push, pull, hybrid.
 - 4.2. JIT.
5. (Re-)Design of products and processes.
 - 5.1. Product (Re-)Design.
 - 5.2. Process (Re-)Design.
 - 5.3. Work organization in industrial environments.

LEARNING ACTIVITIES AND METHODOLOGY

Lectures, exercises, practical sessions, cases and assignments to be carried out by the students and discussed during the sessions, readings assigned by the instructor or identified by the students.

ASSESSMENT SYSTEM

% end-of-term-examination: 60

% of continuous assessment (assignments, laboratory, practicals...): 40

Partial exams will be held, approximately in the tentative weeks indicated in the schedule. Optionally, complementary evaluation system. May apply sampling based grading.

Final evaluation will be based on a written final exam that will provide a global assessment of the knowledge, skills and competences acquired.

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

Minimum grade required in the final exam: 4

BASIC BIBLIOGRAPHY

- Instructor provided material: Slides, exercises... URLs and other Internet resources provided by the instructor, Through Aula Global..
- Jacobs, F.R.; Chase, R.B.; Aquilano, N.J. Operations and Supply Chain Management, Mcgraw-Hill, 16e (2019)

ADDITIONAL BIBLIOGRAPHY

- J. Heizer, B. Render Operations Management, Prentice Hall, 10e. (2011)
- R.G. Schroeder, S.M. Goldstein, M.J Rungtusanatham Operations management. Contemporary concepts and cases, Mc Graw-Hill, 5e (2010)