Course guide
330538 - SPL - Production Systems and Logistics

Last modified: 04/05/2023

Unit in charge: Manresa School of Engineering
Teaching unit: 750 - EMIT - Department of Mining, Industrial and ICT Engineering.

Degree: BACHELOR'S DEGREE IN AUTOMOTIVE ENGINEERING (Syllabus 2017). (Optional subject).

Academic year: 2023 **ECTS Credits:** 6.0 **Languages:** Catalan

LECTURER

Coordinating lecturer: Albiol Rodriguez, Jordi

Others: Vives Costa, Jordi

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CE13. Knowledge and application of production and manufacturing systems.
CE14. Knowledge of and a capacity for project organisation and management. Knowledge of the organisational structures and the functions of the automobile industry.
CE27. Applied knowledge of organization of companies (Specific competence of the mention of Industrial Technologies).
CE6. An adequate understanding of business concepts, the institutional and legal framework of companies, and business organisation and management.

Generical:
CG1. Ability to write and develop projects in the field of automotive engineering for the construction, renovation, repair, maintenance, recycling, manufacture, installation, assembly or operation of: structures, mechanical equipment, energy installations, electrical and electronic installations, plants and industrial plants and manufacturing and automation processes.
CG2. Capacity for management of the activities that are the subject of the engineering projects described in the previous section.
CG5. Knowledge to perform measurements, calculations, valuations, appraisals, appraisals, studies, reports, work plans and the like.
CG6. Ability to handle specifications, regulations and mandatory standards, as well as the specific legislation applicable to this area.
CG8. Ability to apply principles and methods of quality.
CG9. Capacity of organization and planning in the scope of the company and other institutions and organizations.

Transversal:
CT1a. ENTREPRENEURSHIP AND INNOVATION: Being aware of and understanding how companies are organised and the principles that govern their activity, and being able to understand employment regulations and the relationships between planning, industrial and commercial strategies, quality and profit.

02 SCS N3. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 3. Taking social, economic and environmental factors into account in the application of solutions. Undertaking projects that tie in with human development and sustainability.
05 TEQ N3. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.

TEACHING METHODOLOGY

MD1 Master class or lecture (EXP)
MD2 Problem solving and case study (RP)
MD6 Large-scale project or assignment (PA)

LEARNING OBJECTIVES OF THE SUBJECT

1. Differentiate between strategic and tactical aspects of production operations management.

2. To understand the concept of planning and to differentiate the levels: strategic, tactical and operational, as a basis for the design of production plans and programmes.

3. To design an aggregated production plan and to establish the main characteristics of the master production schedule as a concretion of the aggregated planning.

4. To know what functions stocks fulfil in production systems, to identify the costs associated with management and to have a series of basic inventory management models available, both for items with independent and dependent demand.

5. Identify the main functions carried out in the process of planning and control in the very short term.

6. Understand the concept of logistics and the way in which the logistics chain has to be integrated in order to obtain competitive advantages.

7. Know the basic concepts of the purchasing and procurement function.

8. Contextualize the purchasing function within the company.

9. To study the change of purchasing management model.

10. Knowing the different aspects of distribution logistics and the trends that exist.

11. To understand the management of warehouses and the innovations in this function.

STUDY LOAD

Type	Hours	Percentage
Hours large group	30,0	20.00
Self study	90,0	60.00
Hours small group	30,0	20.00

Total learning time: 150 h

CONTENTS

1. Production and process design

Description:
i. Introduction at the address of operations: strategic and tactical decisions
ii. Design of the product
iii. Selection and design of the productive process

Full-or-part-time: 6h 30m
Theory classes: 2h
Laboratory classes: 3h
Self study : 1h 30m

2. Planning of the production

Description:
i. Planning of the production
ii. Planning added
iii. Master programming of the production: PMP

Full-or-part-time: 12h
Theory classes: 4h
Laboratory classes: 4h
Self study : 4h

3. Localización de la producción y distribución en planta

Description:
i. The localization of the productive activity
ii. Distribution at plant

Full-or-part-time: 12h
Theory classes: 4h
Laboratory classes: 4h
Self study : 4h

4. Management of inventories and necessities of materials (MRP)

Description:
i. The management of inventories
ii. Management of inventories of articles with independent demand
iii. Management of inventories of articles with dependent demand

Full-or-part-time: 12h
Theory classes: 4h
Laboratory classes: 4h
Self study : 4h

5. Planning and control at short term

Description:
i. Planning and control at very short term
ii. Obtention of the program of operations. Assignment of the charge at work centres
iii. Sequencing

Full-or-part-time: 12h
Theory classes: 4h
Laboratory classes: 4h
Self study : 4h

6. Basic concepts of the logistics

Description:
i. The logistics: concepts and aims
ii. The logistics as a competitive advantage
iii. Integral logistics
iv. The future of the logistics

Full-or-part-time: 12h
Theory classes: 4h
Laboratory classes: 4h
Self study : 4h

7. Purchases and procurements

Description:
i. Introduction at the function of purchases and procurements
ii. The function of purchases
iii. Evolution of the model of management of purchases
iv. The negotiation

Full-or-part-time: 12h
Theory classes: 4h
Laboratory classes: 4h
Self study : 4h

8. Logistics in Lean Production Systems

Description:
i. Fundamentals of Lean Production Systems
ii. Value stream
iii. Lean methods: 5s, PDCA, Kaizen, Pull, Kanban
iv. Suppliers. Lean Implementation

Full-or-part-time: 11h 30m
Theory classes: 4h
Laboratory classes: 4h
Self study : 3h 30m

ACTIVITIES

Activity 1 - Topics 1 to 3

Description:
Activity on the contents of topics 1 to 3 to be carried out in the classroom individually and/or in a complementary way outside the classroom to be delivered.

Material:
Material available at the Atenea Campus and bibliography of the subject

Full-or-part-time: 2h
Guided activities: 2h

Activity 2 - Topics 4 and 5

Description:
Activity on the contents of topics 4 and 5 to be carried out in the classroom individually and/or in a complementary way outside the classroom to be delivered.

Material:
Material available at the Atenea Campus and bibliography of the subject

Full-or-part-time: 2h
Guided activities: 2h

Activity 3 - Topics 6 to 8

Description:
Activity on the contents of topics 6 to 8 to be carried out in the classroom individually and/or in a complementary way outside the classroom to be delivered.

Material:
Material available at the Atenea Campus and bibliography of the subject

Full-or-part-time: 2h
Guided activities: 2h

GRADING SYSTEM

The total grade of the course will be given by the following contributions:
Activity 1: 30% grade
Activity 2: 30% note
Activity 3: 30% note
Class attendance and participation: 10% note

BIBLIOGRAPHY

Basic:
- Cuatrecasas Arbós, Lluís. Ingeniería de procesos y de planta : ingeniería lean. Barcelona: Profit, 2017. ISBN 9788416904006.
- Dopacio, Cristina Isabel; Lázaro Aguilera, Isabel; Martín Gómez, Sonia; Masa Lorenzo, Critina Isabel. Práctica de organización, producción y operaciones [on line]. Madrid: Pearson Educació, S.A, 2018 [Consultation: 08/06/2022]. Available on: https://www-ingebook-com.recursos.biblioteca.upc.edu/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=8240. ISBN 9788490356050.
- Miranda González, Francisco Javier; Chamorro Mera, Antonio; Rubio Lacoba, Sergio. Dirección de operaciones : casos prácticos y recursos didácticos. Madrid: Paraninfo, 2014. ISBN 9788428334402.

Complementary:
- Heizer, Jay H; Render, Barry; Munson, Chuck. Principles of operations management : sustainability and supply chain management [on line]. Tenth edition, Global edition. Essex, England: Pearson Education Limited, [2017] [Consultation: 31/05/2022]. Available on: https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?docID=6265315&pq-origsite=primo. ISBN 9781292153018.
- Jacobs, F. Robert; Chase, Richard B. Administración de operaciones : producción y cadena de suministros [on line]. Decimoquinta edición. México: McGraw Hill Education, 2019 [Consultation: 27/05/2022]. Available on: https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?docID=5611013. ISBN 9781456261412.
- Geunes, Joseph. Operations planning : mixed integer optimization models [on line]. New York: CRC Press, 2014 [Consultation: 27/05/2022]. Available on: https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?docID=1686368. ISBN

9781482239911.