



Course guide

240062 - 240062 - Organisation and Management

Last modified: 26/01/2024

Unit in charge: Barcelona School of Industrial Engineering
Teaching unit: 732 - OE - Department of Management.

Degree: BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Compulsory subject).
BACHELOR'S DEGREE IN AUTOMOTIVE ENGINEERING (Syllabus 2017). (Optional subject).

Academic year: 2023 **ECTS Credits:** 4.5 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: Manel Mateo

Others: Joan Ignasi Moliné, Iñaki Gras, Oscar Gil, Manel Mateo, Enric Corella, Inés Boj, David Costejà, Ernest Garrido, Pol Gil

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

1. Knowledge applied to business/company organisation.
2. Basic knowledge of industrial production systems.

TEACHING METHODOLOGY

The course consists of the following training activities:

- * Theoretical sessions. A part of these sessions corresponds to a master class (lectures) or to solve doubts or give explanations on knowledge worked in advance. And the rest is devoted to participatory-guided classes.
- * Practical sessions. They correspond to a laboratory class where the students in groups of 3 or 4 apply quantitative tools in order to understand how to apply the procedures introduced in lectures.
- * This is complemented by self study on concepts and exercises; this activity is distance learning.
- * Finally, we consider the evaluation activities (mid-term exam and final exam).

LEARNING OBJECTIVES OF THE SUBJECT

The main objective is to introduce a set of decisions related to the management of manufacturing and logistics systems and supply chain, focussed on the operations management, and provide a basic conceptual view and some elementary management tools.

At the end of the course, the student is expected to be able to:

- * Identify the types of problems in management of the manufacturing and logistics systems and developing the appropriate procedures of resolution to provide feasible and reasonable solutions.
- * Identify which decisions to take in the short-term and medium-term in the behaviour of industrial engineering (Operations Management) and the most common criteria.
- * Use the appropriate quantitative techniques to support the decision making.
- * Develop the ability of reasoning in real situations of management.
- * Manage several kinds of manufacturing and logistics systems (goods or services, product-focused or process-focused ...).



STUDY LOAD

Type	Hours	Percentage
Hours medium group	15,0	13.33
Hours large group	30,0	26.67
Self study	67,5	60.00

Total learning time: 112.5 h

CONTENTS

TOPIC 1. Introduction to management and industrial engineering

Description:

Definition of production, manufacturing and logistic system, supply chain.

Specific objectives:

Identify the managerial characteristics for different organizations and in particular for manufacturing and logistics systems.
Place each of the decisions on manufacturing and logistics systems in the general scheme of decision making.

Related activities:

Theoretical lecture.
Exercise.

Full-or-part-time: 5h

Theory classes: 3h
Self study : 2h

TOPIC 2. Costs and investments

Description:

Costs. Classification of costs. Break-even point. Productivity. Process capacity.
Investments: cash-flows; intertemporal factor. Evaluation of investments: NPV, IRR.

Specific objectives:

Classify the costs involved in a management decision.
Determine the best investment options from one or more criteria.

Related activities:

Theoretical lecture.
Exercise.

Full-or-part-time: 6h 30m

Theory classes: 2h
Practical classes: 1h
Self study : 3h 30m



TOPIC 3. Project planning

Description:

Planning and scheduling of a project. Management issues. Definition of task and types of links: potential, cumulative, disjunctive. Classification of problems. Potential problems. Drawings: Gantt, Roy and PERT; resource loading curves. Budgets.

Specific objectives:

Identify the key elements in project planning and scheduling.

Use the appropriate procedure to handle problems with potential links between tasks.

Prepare a budget.

Related activities:

Theoretical lecture.

Exercise.

Full-or-part-time: 7h

Theory classes: 2h

Practical classes: 1h

Self study : 4h

TOPIC 4. Inventory management

Description:

Definition of inventory, classification and costs. Inventory management. ABC analysis. Deterministic models: EOQ formula; simultaneous supply and usage; quantity discounts; case of several items; manufacturing several articles in a single machine; non-homogeneous demand.

Specific objectives:

Identify the different types of costs and elements to be considered in inventory management.

Solve a situation of inventory management in a deterministic context, using the appropriate model.

Identify the relevance of each product in a global context.

Related activities:

Theoretical lecture.

Exercises.

Full-or-part-time: 24h

Theory classes: 5h

Practical classes: 4h

Self study : 15h



TOPIC 5. Operations planning

Description:

Concept and levels of planning. Characteristics of a production plan. The Master Production Schedule (MPS). Determination of a MPS: graphical analysis, intuitive analysis, analytical models (method of Bowman).

Specific objectives:

Identify the elements to be considered in planning (demand, capacity and costs).
Develop a Master Production Schedule intuitively or optimally.

Related activities:

Theoretical lecture.
Exercises.

Full-or-part-time: 15h

Theory classes: 4h
Practical classes: 2h
Self study : 9h

TOPIC 6. Requirements planning

Description:

General considerations in requirements planning. Product structure: bill of materials. Material Requirements Planning (MRP) and Capacity Requirements Planning (CRP). MRP-II. Distribution Requirements Planning (DRP).

Specific objectives:

Understand the BOM of a product.
Determine the supply and manufacturing orders to meet a plan.
Determine the amount of resources required for manufacturing and distribution.

Related activities:

Theoretical lecture.
Exercise.

Full-or-part-time: 17h 30m

Theory classes: 3h
Laboratory classes: 2h
Self study : 12h 30m

TOPIC 7. Operations scheduling

Description:

Assignment, sequencing, timing. Classification of problems. Notation. One single machine. Criteria for sequencing. The flow-shop problem: exact procedure (2 machines) and heuristics (more than 2 machines). The job-shop. The dispatching methods.

Specific objectives:

Determine the type of flow in a given production system.
Determine a schedule for manufacturing operations, using the appropriate procedure.

Related activities:

Theoretical lecture.
Exercises (they referred to manufacturing and logistic operations).

Full-or-part-time: 23h

Theory classes: 6h
Laboratory classes: 4h
Self study : 13h



TOPIC 8. Global management in the organizations

Description:

Control: KPI. Lean Management and Just In Time, and their management tools. ERPs and implementation. Evolution: continuous improvement and reengineering.

Specific objectives:

Identify areas of improvement in methods of work.

Acquire a vocabulary of concepts used in management (ERP, TQM, JIT, TOC, B2B...).

Related activities:

Theoretical lecture.

Practical exam.

Full-or-part-time: 14h 30m

Theory classes: 5h

Practical classes: 1h

Self study : 8h 30m

GRADING SYSTEM

The evaluation is done by several methods:

- (1) a final exam (EF) with a maximum of three hours duration, consisting of several theoretical and practical exercises in which the student must demonstrate the ability to apply learned knowledge and to develop specific procedures of resolution;
- (2) a mid-term exam (PP) with a maximum of 1h15 'duration, in which the student is basically faced to intellectual agility questions and short exercises;
- (3) evaluation during practical sessions (TP), in which the student must demonstrate his/her progressive learning during practical sessions in response to 3 or 4 short answer questions about what to be held by the end of the session;
- (4) theory challenges (RT), to be carried out in the theory sessions of the course, involve solving situations of a practical nature to apply procedures to complex cases similar to reality.

The final grade for the course N_{final} will be obtained:

$$N_{final} = 0,6 \cdot EF + 0,2 \cdot PP + 0,1 \cdot \max\{TP; EF\} + 0,1 \cdot \max\{RT; PP\}$$

In case the student attends the retake exam of the course (REA), the grade will be the highest between the final exam (EF) and the retake exam (REA). Then the final grade of the course N_{final} will be calculated:

$$N_{final} = 0,6 \cdot REA + 0,2 \cdot PP + 0,1 \cdot \max\{TP; REA\} + 0,1 \cdot \max\{RT; PP\}$$

EXAMINATION RULES.

The final exam (EF), as well as the equivalent reevaluation exam (REA), and the mid-term exam (PP) are open books. Electronic devices are not allowed, except pocket calculator (mobile phone or any other devices are not allowed).

The assessment of the mid-term exam PP will be based on the content of topics 1, 2, 3 and the theoretical content of topic 4. In contrast, the assessment of the final exam EF and the reevaluation exam REA will be based on the practical content of topic 4 and the content of topics 5, 6, 7 and 8.

The evaluation during practical sessions (TP) will be held answering the requested questions, during each one of the sessions. They will be answered at the end of the corresponding session. It is the responsibility of the student to have the right skills taught in theory and use them fit during the available time.

If any trap attempt is detected in the TP evaluation in the practical classes of a subgroup, the qualification will be 0 for all students in that subgroup.

To obtain this mark, the student must attend the group where he/she is enrolled. Otherwise, the mark is 0. Given n practices, the note will be based on the best n-1 marks. The alternative to attend practices, and the mark based on the work done there, is the exam about exercises EP. In case of a strike day, if the student does not attend class, his value n will not be reduced in a unit. This will be repeated for each of the strike days that affect some group of practices.

Regarding the Theory Challenges RT, there will be two and they will consist of answering a series of questions in groups of a maximum of 3 people. You will be notified of the date of its completion. It is a voluntary evaluation, whose alternative is the mid-term exam. A student can do a Theory Challenge in a different group than the one he/she is enrolled in as long as and when: 1. Notify whoever teaches theory in the group where to do it or the coordinator. 2. The group where you want to do it has the activity scheduled before the registration group. 3. There is capacity in the classroom after counting those enrolled in that group.

The student can always attend the re-evaluation exam and the highest grade between the ordinary evaluation and the re-evaluation is kept. In the re-evaluation exam, in addition to the resolution, you are asked to fill in a sheet of answers to the proposed questions.

BIBLIOGRAPHY

Basic:

- Heizer, Jay H. Dirección de la producción y de operaciones : decisiones tácticas [on line]. 11a ed. Madrid [etc.]: Pearson Educación, 2015 [Consultation: 08/09/2020]. Available on: http://www.ingebook.com/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=5776a. ISBN 9788490352854.
- Heizer, Jay H. Dirección de la producción y de operaciones : decisiones estratégicas [on line]. 11a ed. Madrid [etc.]: Pearson Educación, 2015 [Consultation: 08/09/2020]. Available on: http://www.ingebook.com/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=5779. ISBN 9788490352878.
- Vollmann, Thomas E. Manufacturing planning and control for supply chain management. 5th e. New York: McGraw-Hill, 2005. ISBN 0072299908.
- Fitzsimmons, James A. Service management : operations, strategy, and information technology. 8th ed. New York: McGraw-Hill Irwin, 2014. ISBN 9781259010651.
- Chase, Richard B; Jacobs, F. Robert. Administración de operaciones : producción y cadena de suministros [on line]. 15a ed. México [etc.]: McGraw Hill, 2019 [Consultation: 08/07/2022]. Available on: <https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?pq-origsite=primo&docID=5611013>. ISBN 9781456261412.

Complementary:

- Nahmias, Steven. Análisis de la producción y las operaciones. México: Compañía Editorial Continental, 2007. ISBN 9789701062395.
- Rajadell Carreras, Manel ; José Luis Sánchez García. Lean manufacturing: la evidencia de una necesidad [on line]. Madrid: Díaz de Santos, 2010 [Consultation: 08/09/2020]. Available on: <https://ebookcentral.proquest.com/lib/upcatalunya-ebooks/detail.action?docID=3196599>. ISBN 9788479789671.
- Domínguez Machuca, J.A. et al. Dirección de operaciones: aspectos tácticos y operativos en la producción y los servicios. Madrid: McGraw-Hill, 1995. ISBN 8448118030.
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- Waller, D. L. Operations Management : A Supply Chain Approach. 2nd ed. London: Cengage Learning EMEA, 2003. ISBN 9781861528032.
- Krajewski, L. J.; Ritzman, L. P.; Malhotra, M. K. Operations management : processes and value chains. 10th ed. Harlow: Prentice Hall, 2013. ISBN 9780273766834.



- Chapman, Stephen N. Planificación y control de la producción. México: Pearson Educación, 2006. ISBN 970260771X.

RESOURCES

Other resources:

- * Organització i Gestió. Transparencias.
- * Organització i Gestió. Enunciados de las prácticas.