

**COURSE DATA****DATA SUBJECT****Code:** 35829**Name:** Production planning**Cycle:** Undergraduate Studies**ECTS Credits:** 6**Academic year:** 2026-27**STUDY (S)**

Degree	Center	Acad. year	Period
1313 - Degree in Business Management and Administration	Facultat d'Economia	3	Second quarter
1313 - Degree in Business Management and Administration	Facultat d'Economia	4	Second quarter

**SUBJECT-MATTER**

Degree	Subject-matter	Character
1313 - Degree in Business Management and Administration	Compulsory subjects in the pathway: operational management and logistics	ELECTIVES
1313 - Degree in Business Management and Administration	Compulsory subjects in the pathway: operational management and logistics	ELECTIVES

**COORDINATION**

REULA MARTIN MIGUEL

**SUMMARY**

The main objective of this subject is to enable students to learn how formulate and solve real situations by means of mathematical models in the context of Optimisation. The aim is to train students in mathematical tools for decision-making in various critical aspects of business management, especially in the industrial context. Problems of facility location, production planning, task and project scheduling, and inventory management will be studied.

To achieve this, students will be capable of constructing mathematical models that reflect these problems, of implementing these models in computer programmes that allow them to be solved, and of getting the maximum information out of the solutions in order to make optimal decisions and propose effective improvements. So, the subject will prepare students to solve complex real situations or problems with mathematical and computer tools.



## PREVIOUS KNOWLEDGE

### RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

### OTHER REQUIREMENTS

Those related to Mathematics II of the first course

## COMPETENCES / LEARNING OUTCOMES

### 1313 - Degree in Business Management and Administration

Be able to apply analytical and mathematical methods for the analysis of economic and business problems.

Be able to define, solve and present complex problems systemically.

Be able to express oneself in formal, graphic and symbolic languages.

Be able to make decisions.

Be able to solve problems.

Be able to work in a team.

Demonstrate capacity for analysis and synthesis.

Know the characteristics of the different production or service provision systems and know how to manage them under criteria of efficiency and effectiveness in close interrelation with the other areas of the company and with its environment.

## DESCRIPTION OF CONTENTS

### 0. Introduction

Introduction to Operations Research  
The optimisation problem  
Operations Research in business

Models and classification  
Steps in the modelling process



## 1. Basic concepts

Models and classification  
Key issues in modelling  
Implementation and resolution

## 2. Project management

Introduction  
Project planning  
Project monitoring and control  
Project management software.

## 3. Inventory Management

Introduction  
Variables involved  
Determining the Economic Order Quantity (EOQ)  
Determination of the Economic Lot Size (ELS)

## 4. Production Planning

Introduction to production systems and methods for production management  
Production Planning and Lean manufacturing  
Aggregate planning. Disaggregation of decisions and aggregation of information  
Scheduling on a workstation

## 5. Multiobjective Programming

Introduction  
Modelling multi-objective problems  
Generating techniques  
Goal programming

## WORKLOAD

### PRESENCIAL ACTIVITIES

Activity	Hours
Theory	30,00
Computer classroom practice	30,00
<b>Total hours</b>	<b>60,00</b>

**NON PRESENCIAL ACTIVITIES**

Activity	Hours
Attendance at other activities	0,00
Individual or group project	10,00
Independent study and work	45,00
Preparation of lessons	25,00
Preparation for assessment activities	5,00
Resolution of case studies	5,00
<b>Total hours</b>	<b>90,00</b>

**TEACHING METHODOLOGY****Theory classes:**

The professor will emphasise the main aspects and those that are more difficult to understand, will give model examples and will guide the students' study through the materials available in the Aula Virtual and the reference texts. At the end of the class, will indicate the materials needed for the following class, so that the student can prepare the session.

**Practical classes:**

The practical classes will essentially deal with aspects related to modelling, computer resolution and interpretation, applying all the relevant theory, of the results obtained.

The professor will previously solve some models and will propose the development of others for subsequent classes. In each class, students must be able to justify the suitability of their own model and the decisions to be taken in the light of the results.

The theoretical and practical classes are completed with the proposal of individual and/or team exercises in which students will model, solve with computers and interpret solutions to problems in the field of economics and business.

**EVALUATION**



- **I. Continuous assessment (40%).** Based on the participation and involvement of the student in the teaching-learning process and in the practical activities developed by the student during the course, from the elaboration of individual and/or group projects, with defence of the positions developed. Out of a maximum of 4 points, the study of practical cases, their mathematical modelling, their resolution with a computer and the interpretation and discussion of the results obtained will be assessed and, where appropriate, may also contain theoretical-practical exercises.
- **II. Final exam (60%).** The final exam will consist of solving theoretical and practical problems.

In order to pass the course, **it will be necessary to obtain at least 4/10 points in the final exam and at least 4/10 points in the continuous assessment, and the sum of both marks must not be less than 5 points.** If the minimum mark required in either of the two parts is not reached, the maximum mark that can be obtained will be 4.5.

Both at the first and, if applicable, at the second call, the student must take the final exam (out of 6 points). Optionally, on the same date, the student may take the exam (out of 4 points) of the subject corresponding to the continuous assessment.

In both examinations, the professor may require students who wish to take the optional exam to request it by e-mail at least 5 days in advance.

## REFERENCES

- Chopra, Sunil (2019) *¿Supply Chain Management: Strategy, Planning, and Operation¿* Pearson.
- Dominguez Machuca, J.A.(2003). *¿Dirección de operaciones : aspectos tácticos y operativos en la producción y los servicios ¿*. Mc Graw Hill. Madrid
- Ghallab, M., Nau, D., Traverso, P. (2004) *¿Automated Planning Theory and Practice¿*. Elsevier.
- Heizer, J. y Render, B (2015) *¿Dirección de la Producción y de Operaciones. Decisiones Tácticas¿*. Pearson Educación.
- Heizer, J. y Render, B (2015) *¿Dirección de la Producción y de Operaciones. Decisiones Estratégicas¿*. Pearson Educación.
- Hillier, F.(2021) *¿Introduction to Operations Research¿* Mc Graw Hill.