

30117 - Production Management

Syllabus Information

Academic Year: 2019/20

Subject: 30117 - Production Management

Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia

179 - Centro Universitario de la Defensa - Zaragoza

Degree: 457 - Bachelor's Degree in Industrial Organisational Engineering

563 - Bachelor's Degree in Industrial Organisational Engineering

425 - Bachelor's Degree in Industrial Organisational Engineering

ECTS: 6.0

Year: 2

Semester: 425 - Second semester

563 - First semester

Subject Type: Compulsory

Module: ---

1.General information

1.1.Aims of the course

The subject and its expected results respond to the following approaches and objectives:

The knowledge and use of basic instruments for the management of the production / operations area in organizations. In particular, we look for:

1. The understanding of the economic phenomena that affect them day by day, not only as future engineers but as individuals trained members of a society.
2. The approach to the operational reality of the company.
3. Knowledge of an economic and business glossary, necessary for analysis and discussion.
4. Start contact with the reading, the meaning and interpretation of the economic, financial and operational information of the company.
5. Present the basic concepts about the meaning of the production function in organizations and the interrelation that it generates with the rest of the areas of the organization.
6. Analyze, based on the available information, the organization of the productive activity of the company.
7. To be able to translate, through the resolution of practical cases published for that purpose, all the theoretical knowledge acquired, making an impact on their autonomous work, given the importance of non-contact credits within the framework of the European Higher Education Area (EHEA).

1.2.Context and importance of this course in the degree

The subject "Direction of production" is a subject of 6 ECTS credits and compulsory that is part of the Degree in Industrial Organization Engineering.

Once the student has completed the basic subjects that provide an overview of the functioning of organizations, the subject "Production Management" will show you how to manage this functional area, recognizing that it should act in coherence with the rest of functional areas and that can be source of competitive advantage for the success of the company in its sector. The meaning of the subject in the degree is justified in that its design aims to introduce the student to the knowledge of the models and quantitative techniques which will lead to efficient decision making in the area of operations, which determines the productive activity of the company. In this way, it helps to train professionals capable of performing tasks of management, advice and evaluation in organizations, serving the general objective of the Degree in Industrial Organization Engineering.

1.3.Recommendations to take this course

Although there are no prerequisites for the completion of this subject, it is recommended that those who take it take into account the knowledge acquired in "Fundamentals of Business Administration" and in "Organization and Management of companies", for a better contextualization and understanding of it.

2. Learning goals

2.1. Competences

Upon passing the subject, the student will be more competent to acquire the following skills:

Basic and general competences:

- Ability to plan, budget, organise, manage and monitor tasks, people and resources (C02).
- Ability to solve problems and take decisions with initiative, creativity and critical reasoning (C04).
- Ability to apply Information and Communication Technologies (ICTs) within the field of engineering (C05).
- Ability to communicate knowledge and skills in Spanish (C06).
- Ability to analyse and evaluate the social and ecological impact of technical solutions, behaving ethically, with professional responsibility and social commitment, always striving for quality and continuous improvement (C08).
- Ability to work in a multidisciplinary group and in a multilingual setting (C09).
- Ability to manage information; skills to handle and apply technical specifications and the necessary legislation to practise engineering (C10).
- Ability to continue learning and develop self-learning strategies (C11).

Specific competences:

- Knowledge and capacities to design, manage and organize productive and logistic systems in a business (C29).

2.2. Learning goals

To overcome this subject, the student must attain the following learning goals:

1. Distinguishing the different production strategies as well as identifying the influence of the globalisation of operations in the production strategy of the company and planning them.
2. Associating the types of productive processes with the product life cycle in the market and selecting the production process according to different parameters.
3. Associating and applying the types of distribution in plant with the type of productive system. Knowing how to do the balancing of an assembly line.
4. Knowing how to use the different charts for the representation of work methods.
5. Identifying the different stages in the improvement of a productive process.
6. Applying time measurement techniques and time calculation of tasks.
7. Organizing the planning, programming and production control of a company. Knowing and differentiating the different phases.
8. Using techniques and applications to manage the production process of the organisation and being able to put them into practice in real environments.
9. Applying scheduling techniques and methods to make decisions about assigning and sequencing jobs.

2.3. Importance of learning goals

The organisations produce goods and/or services, which they release to the market and, for this, they must coordinate a set of elements that configure their operations; interrelating them with the rest of activities in the areas of marketing, finance and accounting, etc.

The students knowledge of the adequate quantitative techniques will allow efficient decision making in the operations area. In this way, it contributes to training professionals capable of performing management tasks, counsel and evaluation in organisations, in order to support the general objective of the Degree in Industrial Organization Engineering.

Among the different types of engineering professionals companies are looking for, there are: (i) managers of companies in different functional areas, such as production/operations, logistics, or quality, (ii) project managers and (iii) purchasing and supply managers, among others. In order to carry out the previous professional tasks effectively and efficiently, it will be necessary to master the contents of the subject.

The importance of the learning goals of this subject lies in knowing the importance of concepts such as production, productivity, break-even point, yield management, MRP (Material Requirements Planning) and ERP (Enterprise Resource Planning), among others.

Knowledge of how the production/operations area of the organizations works and the capacity to perform any work related to their management is considered essential to access jobs that involve decision making in the production/operations area as

well as the decisions made by the people responsible for planning activities.

3. Assessment (1st and 2nd call)

3.1. Assessment tasks (description of tasks, marking system and assessment criteria)

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CONTINUOUS EVALUATION TEST

Following the spirit of Bologna regarding the degree of involvement and continued work of the student throughout the course, the evaluation of the subject contemplates the method of Continuous Evaluation as the most appropriate to be in line with the guidelines set by the framework of the EEES.

However, in order to improve the student's motivation and without restricting the right to opt for continuous assessment, attendance at daily class activities will be mandatory. For these purposes, it will be considered valid if the attendance to class is accredited in more than 80%.

Therefore, different activities have been designed, consisting of Evaluation Tests on the thematic blocks in which the subject of the course has been structured.

The evaluation process will be carried out according to the:

? Direct observation of the student to know his / her attitude towards the subject and the work it demands (attention in class, completion of commended assignments, resolution of issues and problems, active participation in the classroom, etc.).

? Checking their progress in the conceptual field (questions in class, comments in the classroom, etc.).

? Performing oral and / or written tests periodically to assess the degree of knowledge acquired, as well as the qualities of expression that, at this educational level, must be widely corrected.

The detail of the evaluation tests is as follows:

? The Assessment Tests will consist of written tests and practical work with a value of 100% of the final grade, specifically:

1. Written tests. For the evaluation of the learning results will consist of TWO theoretical-practical tests of the contents seen to date, consisting of the development of theory questions and problem solving. The evaluation criteria for the questions go through the accuracy, relevance and clarity in the answer to them. Constitutes 60% of the valuation

2. PRACTICAL Tests. For the evaluation of the learning results will consist in the preparation of works that will be published in the Moodle platform. The evaluation criteria for these tests are the obtaining of results, analysis and interpretation of the same. It constitutes 40%.

? To compensate partials with jobs it is essential to approve both.

? In the event that a result of less than 5 and greater than 3.5 points out of 10 is obtained in some partial and an average score of more than 7 points would serve to approve the suspended partial.

? For the first call may be submitted those students who suspend a partial and only examine the partial suspended.

? For the second call may present those students who had not passed the subject in the first call with the entire agenda.

GLOBAL EVALUATION TEST

Those students who so wish may be eligible, in the manner and within the term that the center considers, for the possibility of being evaluated through an Extraordinary Global Evaluation in the call, in front of the Continuous Evaluation collected above.

The Extraordinary Global Assessment will consist of a single global test with which 100% of the student's grade will be evaluated. Said test will gather the content of all the material treated throughout the course, by means of theoretical and practical questions of the same type and maintaining the same criteria for its correction as those indicated for the Continuous Evaluation.

For the knowledge of the dates of the aforementioned test, I refer to the EUPLA website (<http://www.eupla.unizar.es>).

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The evaluation of the subject will include both conceptual aspects and practical applications. Throughout the semester, two written evaluation tests will be carried out:

- Mid-term exam (MTE): 40%

- Final exam (FE): 60%

The Mid-term exam will be a theoretical-practical exam of the contents seen to date.

The Final exam will be a theoretical-practical exam of the rest of the contents of the subject.

The accuracy in the answers, the rigor, the correct, clear and orderly reasoning, the mastery of the terminology, as well as the accuracy in the result of the practical exercises will be evaluated.

At the half of the semester (and subject to the schedule of the University Center of Defence) the Mid-term exam will take place and at the end of the semester the Final exam will take place.

The final grade of the subject "Production Management" will be:

$$FG = 0.4 * MTE + 0.6 * FE.$$

To pass the course, students must obtain a grade equal to or above 5 out of 10.

Students who have not passed the subject in the February session will have a second session to be held in August in which they will evaluate all the content of the subject (topics 1 to 9). In the August session, the evaluation will consist of a single global exam and, therefore, the final grade of the subject will be the grade obtained in this exam. This exam will evaluate all the content of the course, by means of theoretical and practical questions.

To know the dates of completion of the aforementioned tests, you can consult the web page of the CUD-AGM (University Center of Defence located in the General Military Academy): <http://cud.unizar.es/calendarios>.

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

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The learning process designed for this subject is based on the following:

Strong interaction between the teacher/student. This interaction is brought into being through a division of work and responsibilities between the students and the teacher. Nevertheless, it must be taken into account that, to a certain degree, students can set their learning pace based on their own needs and availability, following the guidelines set by the teacher.

The subject is conceived as a combination of contents, yet organized into two fundamental and complementary forms, which are: the theoretical concepts of each teaching unit and the solving of problems or the resolution of questions at the same time supported by other activities.

The organization of teaching will be carried out using the following steps:

- Lectures: Theoretical activities carried out mainly through exposition by the teacher, where the theoretical supports of the subject are displayed, highlighting the fundamental, structuring them into topics and or sections, interrelating them.
- Practice Sessions: The teacher resolves practical problems or cases for demonstrative purposes. This type of teaching complements the theory shown in the lectures with practical aspects.
- Individual Tutorials: Those carried out giving individual, personalized attention with a teacher from the department. These tutorials may be in person or online.

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- Lectures or theoretical sessions.
- Practical sessions.
- Office hours.

4.2.Learning tasks

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Throughout the semester the course includes the following learning tasks:

Face-to-face generic activities:

1. Lectures: the theoretical concepts of the subject will be explained and practical examples will be developed by the teacher.
2. Practice tutored problems and cases for discussion: Students will develop examples and conduct problems or case studies concerning the theoretical concepts studied.

Generic non-class activities

1. Tutored autonomous activities: These activities will be guided by the teacher of the subject. They will focus both papers, either individually or in small groups, as the study methodology necessary or convenient for the assimilation of each of the aspects developed in each subject.
2. Reinforcement activities: Through the virtual learning portal Moodle various activities that reinforce the basic contents of the subject will be published. The implementation of these activities will be personalized and controlled.
3. Individual tutorials: They may be actual or virtual.
4. Independent learning activities: Students must carry out the for:
 - ? The study and assimilation of the theory presented in lectures.
 - ? Understanding and assimilation of solved problems and practical cases.
 - ? The preparation of seminars, solving proposed problems, etc.
 - ? The preparation of the written tests Continuous Assessment and Global Assessment.

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- Lectures.
- Practical sessions.
- Office hours: personalised attention.

4.3.Syllabus

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The contents of the subject are essential for achieving learning outcomes.

The choice of the content of the various teaching units was made seeking the express clarification of the final objective so that with the combination of knowledge the student obtains a structured and assimilable knowledge to a student in Industrial Management Engineering

The theoretical basis articulated in ten teaching units encompassed in four thematic sections. These topics collect the contents needed for the acquisition of predetermined learning outcomes.

SYNTHETIC CONTENT

? Section I

UNIT 1: INTRODUCTION TO OPERATIONS MANAGEMENT

UNIT 2: PURCHASING MANAGEMENT

? Section II

UNIT 3: INVENTORY MANAGEMENT

UNIT 4: STATISTICAL QUALITY CONTROL FOR FINISHED PRODUCTS

? Section III

UNIT 5: PRODUCTION STRATEGY

UNIT 6: METHODS of ENGINEERING. WORK STUDY

UNIT 7: TIME AND MOTION STUDY

? Section IV

UNIT 8: PLANT LAYOUT STUDY

UNIT 9: PROGRAMMING AND CONTROL PROJECT

UNIT 10: LEAN MANUFACTURING

Each topic exposed has associated practices in this regard, whether through practical cases, interpretation and commentary on readings associated with the subject and/or work leading to obtaining results and their analysis and interpretation. As topics are developed they will go raising practices in the classroom or through the Moodle platform.

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The short syllabus for ?Operations management? (Defence) is shown in Table 1.

Table 1. ?Operations management? (Defence) short syllabus

Section I. Operations and Productivity
1. Operations
2. Productivity
3. Operations strategy in a global environment
Section II. Operations design
4. Design of goods and services
5. Process strategy
6. Capacity planning
Section III. Tactical and operational decisions
7. Aggregate planning
8. Material Requirements Planning (MRP) and Enterprise Resource Planning (ERP)
9. Short-term scheduling

SYLLABUS

Section I. Operations and Productivity

- **1. Operations**
 - 1.1. What is ?Operations Management? (OM)?
 - 1.2. Organising to produce goods and services
 - 1.3. Why study Operations Management?
 - 1.4. What Operations Managers do? Ten critical decisions
 - 1.5. Operations in the service sector
 - 1.6. New trends in OM
 - 1.7. Ethics and social responsibility
- **2. Productivity**
 - 2.1. Productivity challenge
 - 2.2. Productivity measurement and analysis: Single-factor productivities
 - 2.3. Productivity measurement and analysis: Multi-factor productivities

- 2.4. Key variables for improving productivity
- 2.5. Productivity in the service sector
- **3. Operations strategy in a global environment**
 - 3.1. Introduction. A global view of operations
 - 3.2. Defining and developing missions and strategies
 - 3.3. Internal and external environmental factors that affect OM
 - 3.4. Strategies for achieving competitive advantage through operations
 - 3.4.1. Competing on Differentiation
 - 3.4.2. Competing on Cost (Low-cost strategy)
 - 3.4.3. Competing on Response
 - 3.5. Strategy development and implementation
 - 3.6. Global Operations Strategy Options
 - 3.6.1. International strategy
 - 3.6.2. Multi domestic strategy
 - 3.6.3. Global strategy
 - 3.6.4. Transnational strategy
- **Section II. Operations design**
- **4. Design of Goods and Services**
 - 4.1. Goods and services selection
 - 4.2. Generating new products
 - 4.3. Product development
 - 4.4. Issues for product design
 - 4.5. Time-based competition
 - 4.6. Defining a product
 - 4.7. Document for production
 - 4.8. Service design
 - 4.9. Application of decision trees to product design
 - 4.10. Transition to production
- **5. Process strategy**
 - 5.1. Four process strategies: process focus, repetitive focus, product focus and mass customization
 - 5.2. Process analysis and design
 - 5.3. Service process design
 - 5.4. Selection of equipment and technology
 - 5.5. Production technology
 - 5.6. Technology in services
 - 5.7. Process redesign
- **6. Capacity planning**
 - 6.1. Capacity: design capacity, effective capacity, utilization and efficiency
 - 6.2. Capacity planning
 - 6.3. Demand and capacity management in the service sector
 - 6.4. Break-even analysis. Multiproduct case
 - 6.5. Applying Net Present Value (NPV) to strategy-driven investments regarding capacity
- **Section III. Tactical and operational decisions**
- **7. Aggregate Planning**
 - 7.1. The planning process?
 - 7.2. The nature of aggregate planning
 - 7.3. Aggregate planning strategies
 - 7.4. Methods for aggregate planning?
 - 7.5. Aggregate planning in Services
 - 7.6. Yield management
- **8. Material Requirements Planning (MRP) and ERP**
 - 8.1. Forecasting
 - 8.2. Inventory management: dependent demand *versus* independent demand?
 - 8.3. Dependent inventory model requirements
 - 8.4. Material Requirements Planning (MRP)?

- 8.5. Lot-sizing techniques
- 8.6. Extensions of MRP
- 8.7. MRP in Services?
- 8.8. Enterprise Resource Planning (ERP)
- **9. Short-term scheduling**
 - 9.1. The strategic importance of short-term scheduling
 - 9.2. Scheduling issues, decisions and criteria
 - 9.3. Scheduling process-focused facilities
 - 9.4. Loading jobs. Assignment method
 - 9.5. Sequencing jobs
 - 9.6. Scheduling services

4.4.Course planning and calendar

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The subject has 6 ECTS credits, which represents 150 hours of student work in the subject during the semester, in other words, 10 hours per week for 15 weeks of class.

The summary of the timing of the course activities would be the following:

? Lectures: 35 hours

? Practical classes: 14 hours

? Assessment tests: 6 hours

? Tutored practices: 5 hours

? Tutored Independent learning activities: 32 hours

? Independent learning activities: 58 hours

In the lecture, the theoretical exposition is combined with problem-solving.

The practical classes are directed to the realization of problems, presentation, and discussion of cases. The above activities are distributed weekly in four hours of lecture.

The weekly distribution of the course is done in three blocks of content that structure the subject matter and may vary depending on the evolution of teaching.

? Block I: Week 1 to Week 3

? Block II: Week 4 to Week 9

? Block III: Week 10 to Week 14

? Block IV: Week 15

The dates of the final exams will be published officially in <http://www.eupla.unizar.es>.

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The subject has 6 ECTS credits, which represents 60 hours of face to face activities during the semester.

The summary of the timing of the 60 hours will be as follows:

Lectures: 35 hours

Practical sessions: 19 hours

Exams/Tests: 6 hours

The weekly distribution of the course is structured in three blocks of contents and may vary depending on the evolution of the academic year.

Week #1 - Week #4: Block I (Operations and productivity)

Week #5 - Week #9: Block II (Operations design) and assessment test 1

Week #10 - Week #14: Block III (Tactical and operational design)

Week #15: Overview.

The dates of the assessment tests will be published at <http://tud.unizar.es/calendarios>.

4.5.Bibliography and recommended resources

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The recommended bibliography for this course is available at http://biblos.unizar.es/br/br_citas.php?codigo=30117&year=2019.