

Code:**Credits: 9****Matter: Logistics****Main language of instruction: Italian****Other language of instruction: English**

Teaching Staff

Head instructor

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Introduction

1. Objective of the course :

The Logistics course aims to provide the student with basic knowledge of logistics and the main problems associated with it, depending on the production system considered. In fact, the proposed approach is not limited to logistical concepts as such, but is proposed in continuous reference to industrial cases, for which certain decisions regarding production generate the most appropriate logistical decisions.

In particular, the student is taught the main notions regarding internal logistics, the definitions of organizational models, the classification and sizing of internal handling systems and storage systems.

The main objective of the course is to provide the student with a complete overview of logistics and the basic knowledge to be able to deal with the problems and critical issues connected to it and to develop in the student the ability to understand the most common problems that can arise in a modern production system, favoring a critical management engineering approach, which does not limit itself to considering the specific problem that may arise but which takes into consideration the overall picture of the company.

Objectives

2. Course Structure:

- Definitions and concepts of logistics.
- Industrial plant layout.
- Functions, types and materials used in packaging and the rules underlying their disposal.
- Sizing elements of internal transport systems and storage systems.
- Industrial information flow.

- Elements of distribution logistics.
- Reverse logistics.

Competencies:

A. Knowledge and understanding.

At the end of the course the student will have knowledge of the most important notions regarding logistics, with particular attention to internal logistics and will acquire knowledge of internal handling systems, storage systems, packaging and the main notions regarding their recycling and disposal. Furthermore, the student will acquire the main methodologies used in the sizing of internal transport and storage systems, as well as the problems and critical issues involved in these phases. Finally, the student will have basic knowledge regarding distribution and reverse logistics, the latter both from the point of view of recycling and remanufacturing, and from the point of view of after-sales services.

B. Applying knowledge and understanding.

The student will be able to use the knowledge acquired for the sizing first of all of an industrial plant from the point of view of the layout and the number of machines used, and then move on to that of the handling systems and storage systems used, determining number and characteristics. The ability to apply the knowledge acquired will be integrated and transversal between the different company functions.

C. Making judgements.

The student will have acquired an overall approach for identifying the most convenient solutions for the sizing of part of the production process and the most suitable logistical solutions for the context considered, thus having the ability to independently judge between the different possible solutions identified .

D. Communication skills.

For the topics proposed by the course, the student will be able to address the most common problems related to logistics in a critical and technical manner, having acquired a series of notions and methodologies that allow comparison with the real industrial context.

Syllabus

3. Programme of the course:

Subject 1. The logistics function.

Definitions of industrial plant and added value.
Definitions and general information on logistics.
Evolution of the logistics function over time.
CIM systems.
Reverse logistics.
Recalls and definitions of industrial plants.

Subject 2. Plant layout and logistical choices.

Layout of an industrial plant and impact on logistics.
Study and design of the layout.
Minimum number of machines.
Group Technology.
Flexible Manufacturing System.

Subject 3. Packaging.

Innovation, life cycle, study and detailed design of a product.
The product-packaging system.
Functions and types of packaging.
The pallet and the standardization of load units.
The standardization of information.
Volumetric efficiency of a packaging.
Packaging materials.
Management of packaging and packaging waste.

Subject 4. Traditional and automated transport systems.

General information and classification of internal transport systems.
Traditional transport systems.
Multiphase transport systems.
Flexible automatic guided transport systems (AGV).

Subject 5. Storage systems.

General information on storage systems.
Store classification.
Characteristic indices of storage.
Storage method.

Automation of information flow in storage and distribution systems.

Subject 6. Sizing of transport systems.

Sizing of punctual, linear and superficial transport systems .

Sizing of roller and belt conveyors.

Hoist sizing.

Sizing of AGV systems.

Subject 7. Sizing of storage systems.

ABC analysis and filling curve.

Sizing of a traditional storage system.

Handling cycles and number of trolleys.

Methods for evaluating the cycle times of a stacker crane.

Subject 8. The production information flow in integrated logistics.

Management of the production information flow.

The MRP method.

Just in time.

Stock management of materials.

Safety stock and service level.

Subject 9. Distribution logistics and reverse logistics.

Distribution logistics.

Characteristics of transport modes.

Reverse logistics. A case study: Toyota Motor Italy (year 2005).

Evaluation system and criteria

The examination consists of a written test tending to ascertain the ability to analyze and rework the concepts acquired. This includes open-ended questions or multiple-choice questions, for a total of 26 out of 30 marks.

In addition, four E-tivities. These need to be sent to the instructor in advance of the examination. Each e-tivity counts 1 mark for a total of 4 out of 30 marks.

Bibliography and resources

4. Materials to consult

Notes written by the instructor are available in Italian. The notes cover the course contents and examination programme.

5. Recommended bibliography

Suggested readings are:

- A. Pareschi, A. persona, E. Ferrari e A. Regattieri, "Logistica integrata e flessibile", Società editrice Esculapio, 2011.
- Caron F., Marchet G., Wegner R., "Impianti di movimentazione e stoccaggio dei materiali", Edizioni Hoepli, Milano, 1999.
- A. Monte, "Elementi di impianti industriali", Edizioni Libreria Cortina Torino, 2003.
- A. Pareschi, "Impianti Industriali", Società editrice Esculapio, 2013.