

Course guide 240IME35 - 240IME35 - Intern Transport and Process Simulation Systems

Last modified: 16/05/2023

Academic year: 2023	ECTS Credits: 4.5	Languages: Catalan, Spanish	
Degree:	MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2014). (Optional subject).		
Teaching unit:	712 - EM - Department of Mechanical Engineering.		
Unit in charge:	Barcelona School of Indus	strial Engineering	

LECTURER

Coordinating lecturer:	Ferrer Marti, Laia
Others:	Ferrer Marti, Laia
	de los Santos López, Ma Antonia

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

CEEMEC6. Use the numerical simulation tools for the design, calculation and manufacturing of components, systems and mechanical facilities.

CEMEI22. Knowledge and abilities to verify and control the facilities, processes and products.

CEMEI21. Knowledge on transport and industrial maintenance methodologies and techniques.

TEACHING METHODOLOGY

The teaching methodology is based on two types of activities. First, theoretical classes in which the teacher provides concepts and skills through practical exercises and shows how to apply the exposed knowledge to situations and solving real problems; Most of the sessions are suggested exercises for the students to develop a class with the support of the teacher. Second, in practice classes in small groups in which students perform activities under the supervision of a teacher. In practical work is done, which involves the design and simulation of an automated facility nstallation and internal transport and storage. The work is done in groups of two students and have to make a delivery of a written report and make an oral presentation and defense. In practice sessions and in the development of work teamwork, oral proficiency and writing skills are developed, among others. Visits are made to install storage and maintenance facilities so that students get to know the real operation of such facilities.

LEARNING OBJECTIVES OF THE SUBJECT

Objective: To ensure that students acquire knowledge about the different systems of internal transport and storage and are able to design a facility from certain requirements and to validate their operation using process simulation. Specific objectives: See the specific objectives of each subject and activities.

STUDY LOAD

Туре	Hours	Percentage
Hours small group	27,0	24.00
Self study	72,0	64.00
Hours large group	13,5	12.00

Total learning time: 112.5 h



CONTENTS

Internal transportation

Description:

Study of the transport capacity of the conveyor belts and hand roller. Determining the capabilities of forklifts. Study of problems rollover

Specific objectives:

Having a theoretical and practical basis of continuous Internal transport systems (conveyors, etc.) and discrete (forklift, stacker, etc.) to ascertain its features ahead in the use of production, distribution or storage facilities.

Full-or-part-time: 16h

Theory classes: 6h Self study : 10h

Automated storage, sorting and order preparation

Description:

Analysis of the characteristics of automated warehouses.and storage conditions that justify automation. Presentation of various examples of automated warehouses. Presentation of automatic classification systems. Analysis of their capacity. Description of picking systems.

Specific objectives:

Having a theoretical and practical basis of automated warehouses, automated classification systems and picking to know their characteristics in order to use storage and distribution facilities.

Full-or-part-time: 14h 30m Theory classes: 6h 30m Self study : 8h

Designing a facility installation automated order preparation and distribution

Description:

Calculate the required storage capacity and design alternatives that meet. Calculation of the picking and movement of materials capacity and design of alternatives that meet them. Calculating the need for workers to make processes based on operational shifts. Optimization design considering the overall combination of alternative storage, order preparation, movement of materials and possible shifts .

Specific objectives:

Being able to design a distribution facility and automated picking systems which involved domestic transportation and storage requirements as specified

Full-or-part-time: 36h Laboratory classes: 12h Self study : 24h



Simulation of a distribution and automated order preparation facility

Description:

Modeling the movement of materials and products in a installation by zones and then globally. Deterministic simulation and then random simulation introducing random processes in increasing gradually detail. Experimentation and analysis of statistical results to assess the capacity of moving materials and products. Depending on the results, validate or adjust its design.

Specific objectives:

Being able to model a distribution and picking facility through automated simulation tools and processes used to validate the design of the facility

Full-or-part-time: 39h Guided activities: 13h Self study : 26h

GRADING SYSTEM

Rating system:

The rating is based on two acts of evaluation: a final examination and a evaluation of the work. In the final examination are evaluated theoretical and practical skills are evaluated. The evaluation of the work assesses theoretical and practical knowledge as well as the ability to solve real problems and skills as teamwork, presentation written and oral presentation.

The final grade is calculated according to the formula: = Nfinal 0,7NEP + 0,3NEF

with: NEP: note the work. NEF: Final exam

The reassessment will consist of an exam substuirà the final exam.

EXAMINATION RULES.

In the final examination, can only be brought a calculator. In case there is a theoretical part in the exam, nothing could be brought.

BIBLIOGRAPHY

Basic:

- Bartholdi III, John J. ; HACKMAN, Steven T. Warehouse and distribution science [on line]. Atlanta, EEUU: Georgia Institute of Technology, 2014 [Consultation: 07/10/2015]. Available on: <u>http://www.warehouse-science.com/</u>.

- Pau Cos, Jordi. Manual de logística para la distribución comercial. Madrid: AECOC : CP Consultores : Market Comunicación, 1993. ISBN 8460469093.

- Pau Cos, Jordi ; de Navascués, Ricardo. Manual de la logística integral. Madrid: Diaz de Santos, 1998. ISBN 8479783451.