

DOI-IND-525 Production and Manufacturing Systems

SEMESTER: Spring

CREDITS: 6 ECTS (4 hrs. per week: 3 Theory + 1 Lab, on average)

LANGUAGE: Spanish

DEGREES: Official Master's Degree in Industrial Engineering (MII)

Course overview

This course is an introduction to Production and Manufacturing Concepts: Product Design, Manufacturing Process, Layout Design, Work Design and Lean Manufacturing Techniques. Computer and real practices on Product Design and Manufacturing processes are performed.

Prerequisites

No prerequisites.

Course contents

Theory:

1. Introduction to Production and Manufacturing Systems. Strategic and tactical decisions. Objectives and current trends on Manufacturing Systems.
2. Product Design and Development. Product Life Cycle (PLC). Value Engineering. Concurrent Engineering. Quality Function Deployment (QFD). DFMA. Modular and Ecological Design. Product Design tools: CAD, CAM, CAE and ERP. Product Life Management (PLM). Group Technologies.
3. Selection and Design of Manufacturing Process. Types of Manufacturing Process. Process Analysis and Design Tools. Process Reengineering. Capacity Planning. Automatic Manufacturing Technologies. FMS, Transportation and Industrial Handling Equipment.
4. Layout and Work Design. Types of Layout. Assembly Line Balancing. Human Resources Planning. Work Design Components. Measurement Time Method (MTM). Health Safety Concepts
5. Lean Manufacturing. Lean Principles. Value Stream Mapping (VSM). Lean Factors and Techniques.

Laboratory:

There will be six 2-hour sessions.

- P1.** CAD-CAM practice using CREO.
- P2.** PLM with Windchill (part I).
- P3.** PLM with Windchill (part II).
- P4.** Time Measurement of Electric Motor Assembling.
- P5.** Motor Assembly Line
- P6.** Lean Competition on Motor Assembly Line

Textbook

- Heizer, J., Render, B., Dirección de la producción y de operaciones. Vol. Decisiones estratégicas. Ed. Prentice Hall. 2015
- Heizer, J., Render, B., Dirección de la producción y de operaciones. Vol. Decisiones Tácticas. Ed. Prentice Hall. 2015

Grading

The following condition must be accomplished to pass the course:

- A minimum exam grade of at least 4 over 10.
- A final grade higher or equal to 5.0

The exam grade is obtained as follows:

- Mid-term exam 25%
- Final exam 40%.

The final grade is obtained as follows:

- Exam grade 65%.
- Lab practices (pre and post-lab tests) 25%.
- Class participation and interaction 10%.

Retake:

The following condition must be accomplished to pass the course:

- A minimum final exam grade of 4.0.
- A final grade higher or equal to 5.0

The final grade is obtained as follows:

- Final exam grade 65%.
- Lab practices (pre and post-lab tests) 25%.
- Class participation and interaction 10%.