



Eina Centre Universitari
Fundació Eina
Disseny Art Barcelona

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PROCESSOS DE TRANSFORMACIO INDUSTRIAL

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Supervising Teacher: Silvia Escursell Martinez

Group: 1

Code: 200664

Credits: 6 ECTS

Course: 2

Semester: 2

Typology: Obligatory

Subject: Technology

Schedules:

Group	Schedules	Teacher
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Teaching Guide Index

Subject Presentation

Recommendations

Contents

Methodology

Evaluation

Bibliography and Resources

Learning Outcomes

Subject Presentation

Brief Description:

The subject falls within the field of product design technology. It is focused on providing students with knowledge about the main industrial transformation processes, basic and advanced, linked to the different families of materials, defining their relationship with product design processes.

The subject is characterized by three basic pillars:

- Knowledge is taught from the application of processes and materials to the design project and not from a theoretical point of view.
- The knowledge, taught through case studies, is complemented by multiple visits to manufacturing centers, workshops and production companies where students will be able to practically experience the processes involved and consult their doubts directly with professionals with high expertise in the field.
- The subject proposes synergies with the semester's project subject in the application of acquired knowledge.

It is taught by a professor but with the collaboration of a group of experts in projects linked to the different processes and materials covered.

Training Objectives:

- Understand the role of manufacturing processes in product design
- Understand the relationship between materials, processes and design requirements
- Be able to link functional, mechanical, formal and finishing needs to the most appropriate process and material
- Have design criteria
- Be able to have a specialized language to communicate with manufacturers and generate the appropriate documentation depending on the project and manufacturing process.
- Learn to make and justify technical decisions that affect the outcome
- Understand the implication of cost and the relationship with the process and production volumes

Recommendations

Contents and Methodology

Brief Description:

Ceramics and Aggregates.

- Types and general characteristics of ceramics. Case studies.
- Transformation processes: Manual ceramic lathe, molding, pressed shaping.
- Surface finishes and treatments
- Visit to an industrial ceramics workshop.
- Types and general characteristics of aggregates. Case studies.
- Transformation processes: Molding and press forming.
- Surface finishes and treatments.
- Visit to a company specializing in concrete production.

Glass

- Types and general characteristics of glass and crystal. Case studies.
- Glass transformation processes: mold blowing and blow molding, artisanal techniques. Press molding or automatic blowing.
- Glass treatments and surface finishes.
- Visit to a company specializing in glass production.

Introduction to the additive industry. 3D printing.

- Typologies and general characteristics of the different additive manufacturing technologies.
- Visit to a technology center where you can see how these processes work.

Plastic

- Introduction: Polymerization, Blends, Additives, Mechanical and thermal behavior
- Plastic Materials: Thermosets, Thermoplastics, Rubbers, Silicones, Composites
- Shaping processes: Foaming, Extrusion, Injection, Blowing, Rotomolding, Thermoforming
- Basic rules for designing plastic parts
- Unions of plastic elements
- Surface finishes

Metals

- General types and characteristics: ferrous and non-ferrous metals

- Transformation processes
- Working with metal sheets: Cutting, Folding, Stretching
- Visit to a company specializing in sheet metal
- Extrusion
- Forging
- Foundry
- Visit to a company specializing in non-ferrous metal casting
- Unions of metal elements
- Surface finishes and treatments

Wood

- Industrial formats: solid wood, manufactured planks and veneers
- Wood bending: plywood and steam.
- Unions
- Finishes

Teaching methodology:

The subject is divided into three main blocks:

1. CERAMICS AND GLASS
2. PLASTICS
3. METALS, WOOD

Each of these blocks will consist of the following contents:

- Theoretical classes: case studies
- Workshop classes where theory and practice are combined.
- Making-offs of specific products
- Seminars on specific content taught by experts
- Scheduled visits to workshops and factories
- Independent or group work in the classroom

Training activities:

Block 1 - Ceramics, aggregates and glass: 20% of the grade

1. Practice I: Exercise linked to the ceramics and aggregates block. (10% of the grade).
2. Practice II: Exercise linked to the glass block. (10% of the grade).

Block 2 - Plastics: 20% of the grade

3. Practice I: Understanding and applying knowledge of the different types of plastics on an object to be analyzed. (5% of the grade).
4. Practice II: Understanding and application of knowledge of the manufacturing processes of an object to be analyzed. (5% of the grade).
5. Final block project: Design of a prototype injection mold for the manufacture of modular parts in series. (10% of the grade).

Block 3 - Metals and wood: 20% of the grade

1. Practice I: Exercise linked to the metals block. (10% of the grade).
2. Practice II: Exercise linked to the wooden block. (10% of the grade).

Final subject work 35% of the grade

Attendance and participatory attitude count for 5% of the grade.

Evaluation

General evaluation regulations

A student will be considered "Not Assessable" (NA) if they have not submitted all the learning evidences or have not attended 80% of the classes without justifying their absences. In case of a justified absence, the student must contact the teacher at the time of rejoining to determine the recovery of the activities they missed.

If the student commits any irregularity that may lead to a significant variation in the grade of an evaluation act, that evaluation act will be graded with 0, regardless of the disciplinary process that may be initiated. If several irregularities occur in the evaluation acts of the same subject, the final grade for that subject will be 0.

Continuous evaluation system

The evaluation system of EINA and UAB is a continuous assessment system, the objective of which is for the student to know their academic progress throughout their educational process to allow them to improve it.

The continuous assessment process must include a minimum of three evaluative activities, of two different types, distributed throughout the course, none of which can represent more than 50% of the final grade.

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Review process

The review will consist of a work that encompasses different topics presented throughout the course and that demonstrates having achieved the skills and knowledge necessary.

Learning outcomes of the degree program

Knowledge

Catalogue materials, their properties and physical principles in relation to the conceptualisation and formalisation of design projects, taking into account environmental and sustainability criteria.

Categorise technologies and production processes, along with their respective costs, in relation to the conceptualisation and formalisation of design projects, while ensuring rigour and quality in finishes and details.

Skills

Apply plastic expression skills and knowledge of materials and production technologies in accordance with the objectives of a design project.

Propose design solutions (or solutions in related areas) clearly and precisely, using appropriate vocabulary and techniques of expression and representation.

Graphically represent spaces, volumes, planes, and surfaces using the characteristic techniques of design.

Use digital tools and technologies according to creative and production processes in the field of design

Apply ethical and aesthetic criteria and values to design practice, taking into account the formal dimensions of environments and their diversity.

Adapt visual languages, media, and artistic techniques to the communicative goals of each design project.

Competencies

Manage the development of design projects—individually or in teams—with adaptability, within the organisational context of companies and institutions.

Manage design-related tasks autonomously, planning and organising time and processes in professional and/or academic settings.



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S.KALPAKJIAN, MR SCHMID. Manufacturing, Engineering and Technology. Pearson. Mexico, 2008
THOMPSON ROB. Manufacturing Processes for design professionals. Thames & Hudson. New York, 2007
CHRIS LEFTERI, Manufacturing Techniques for product design. Making it, 2007
A. JACKSON, D. DAY Handbook of woodwork, carpentry and joinery. Ed Prado, Madrid, 1998)
CHRIS LEFTERI, Materials for Design, 2014