



ELABORATION DE PIÈCES TECHNIQUES

DEVELOPMENT OF TECHNICAL PRODUCTS

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| Lecturers : 4.0 | TC : 0.0 | PW : 4.0 | Autonomy : 0.0 | Study : 4.0 | Project : 20.0 | Language : FR

Objectives

This course aims to study the interactions of materials, shapes and processes in the design and industrialization of technical objects. Based on real case studies, this module will address the manufacturing processes of plastic and metallic materials, the strategies to a material (functional criteria and implementation) and a process (economic and technical criteria) as well as the definition of a shape (functional criteria, process and material). We will focus in processes involving transformations of matter: injection, extrusion, thermoforming for polymers, etc., plastic deformations for metals, the addition of 3D matter in additive manufacturing on metallic materials and plastics.

Keywords : Shaping processes, Plastics, Injection, extrusion, thermoforming. Metallic materials, Plastic deformation, Stamping, Additive Manufacturing

Programme

- I. Injection of plastics
 - Design and sizing,
 - Definition and choice of tools,
 - Simulation, implementation and configuration of the injection process.
- II. Additive manufacturing and 3D printing
 - Main design principles in additive manufacturing
 - Topological and mechanical optimizations
 - Numerical and experimental simulation of additive manufacturing processes

Learning outcomes

- Be able to choose a shaping process
- Understand the key points of plastic injection process and be able to design a part mechanical object with injected matter
- Be able to design a stamped metal mechanical object
- To be able to design a metallic mechanical object by additive manufacturing

Independent study

Objectifs : 5 sessions of 4 hours will be carried out by working on a project (including 1 session devoted to oral presentation of the project).

Méthodes : The teaching will be based on an adaptation of the problem-based learning method allowing a concrete enlightening of these processes from real case studies and scenarios.

Core texts

J.-F. Agassant, P. Avenas, J.-P. Sergent, B. Vergnes, M. Vincent, *LA MISE EN FORME DES MATIÈRES PLASTIQUES - 3ÈME ÉDITION*, Lavoisier, 1996

Assessment

Final mark = 50% Knowledge + 50% Know-how
Knowledge = 100 % final exam
Know-how = 100% continuous assessment