



Introduction

The design of material products corresponds to the synergy of three complementary scientific fields: - organizational sciences associated with concepts and the implementation of a systemic approach, - engineering sciences associated with models describing the behavior of matter in a wide disciplinary field, - mathematical sciences associated with analysis and optimization tools. These three scientific fields are taught in General Engineering Schools such as ECL and Objectif. Teaching of the profession is to present to the students their articulation and their implementation in an industrial context. In accordance with the evolution of the design profession, the product-process link will be presented within the framework of two sectors integrating the three geniuses covering all the material products: Civil Engineering, Mechanical Engineering and Electrical Engineering. Major societal issues are discussed, namely ecology by introducing the concepts of recyclability and embodied energy, and innovation by presenting strategies capable of ensuring the success of new products.

Semester

S09

Programme

Learning Outcomes

- Knowledge of engineering systems and taking into account modern means of mock-up digital and co-design.
- Ability to integrate ecological constraints in the design of innovative products.
- Apply creativity methods in the pre-project phase
- Multiphysics approach to products.

Employment Sectors

The design business covers a very wide range of activities in design offices. In addition, the concepts put forward in the lessons are essential for introducing innovation into projects, controlling the quality of products and their recyclability at the end of their life. The industrial sector concerned is very vast encompassing Civil

Requirements

Assesment

Each msm gives rise to a note.

Option Website

Additional Information



PROCÉDÉS DE CONCEPTION AVANCÉE

ADVANCED DESIGN PROCESSES

Lecturers: **Olivier DESSOMBZ**

| Lecturers : 18 | TC : 0.0 | PW : 0.0 | Autonomy : 0.0 | Study : 0.0 | Project : 0.0 | Language : FR

Objectives

Awareness of sustainable development issues and the ecodesign approach. The purpose of setting the context is to re-anchor the engineering student in a societal reality. Use examples to integrate the concepts and put them into practice. Through creativity exercises, learn to develop the ability to project towards future scenarios.

Keywords : Eco-design, circular economy, environmental and social impacts, sustainable development

Programme

From the planet to the products:

- Approach to sustainable development, social responsibility of organizations.
- Limits of resources.
- Ecosystem services, biomimicry.
- Issue of sustainable development, social responsibility of organizations, dimension environmental, social, societal.
- The challenges of eco-design in your design strategy.
- Sustainable development, environmental impacts, eco-design, life cycle ...
- Define the basic functional unit of any Life Cycle Analysis (LCA).

Learning outcomes

- To be able to integrate environmental and social criteria into the design process.
- Understanding of social, environmental, planetary and local issues.
- Create new paradigms, innovate, question what already exists.

Independent study

Objectifs :

Méthodes :

Core texts

Assessment

mini-project



OUTILS MODERNES DE CONCEPTION

MODERN DESIGN TOOLS

Lecturers: **Olivier DESSOMBZ**

| Lecturers : 16 | TC : 0.0 | PW : 0.0 | Autonomy : 0.0 | Study : 4.0 | Project : 0.0 | Language : FR

Objectives

Provide an overview of the optimization methods and the taking into account of uncertainties.
Know the sensory design processes in innovation

Keywords : Optimization, Meta-Heuristics, Meta-models, Uncertainties, Iso-geometry, Sensory Design, Innovation

Programme

Learning outcomes

- Theoretical knowledge: taking into account uncertainties and optimization
- Knowing how to set up a sensory design process

Independent study

Objectifs :

Méthodes :

Core texts

Assessment

mini-projects



CONCEPTION ET CHOIX TECHNOLOGIQUES

DESIGN AND TECHNOLOGICAL CHOICES

Lecturers: **Olivier DESSOMBZ**

| Lecturers : 48 | TC : 0.0 | PW : 0.0 | Autonomy : 0.0 | Study : 0.0 | Project : 0.0 | Language : FR

Objectives

Provide knowledge in multiphysics design, manufacturing methods and eco-design in Civil Engineering

The branch courses (Civil Engineering or Electro-mechanical) given by specialists in the field allow to deepen knowledge in these fields.

Keywords : Multiphysics, manufacturing processes, eco-design

Programme

A course deals with the implementation and expertise of numerical and experimental methods applied to the implementation and optimization of control strategies for the stabilization and isolation of dynamic systems.

A second course deals with manufacturing methods for mechanical parts.

A third course deals with eco-design in Civil Engineering and recycling

The branch courses (Civil Engineering or Electro-mechanical) given by specialists in the field allow to deepen knowledge in these fields.

Learning outcomes

Independent study

Objectifs :

Méthodes :

Core texts

Assessment

Mini-projects



PROJET ICO

FIRST DESIGN OF INNOVATIVE PRODUCTS

Lecturers: **Olivier DESSOMBZ**

| Lecturers : 12 | TC : 0.0 | PW : 0.0 | Autonomy : 10 | Study : 0.0 | Project : 0.0 | Language : FR

Objectives

Imagine innovative products using a "Design thinking" process and check their feasibility in a pre-conception phase . To lay the foundations of a "business model" with an entrepreneurial vision.

Keywords : Innovation, design, entrepreneurship

Programme

- Creativity session for the definition of innovative products
- Competition analysis
- Functional analysis
- Pre-design
- Construction of a business model

Learning outcomes

Independent study

Objectifs :

Méthodes :

Core texts

Assessment

Report + Defense



CONFÉRENCES

CONFERENCES

Lecturers: **Olivier DESSOMBZ**

| Lecturers : 10 | TC : 0.0 | PW : 0.0 | Autonomy : 0.0 | Study : 0.0 | Project : 0.0 | Language : FR

Objectives

Openness to industrial subjects

Keywords :

Programme

According to the availability of industrial stakeholders

Learning outcomes

Independent study

Objectifs :

Méthodes :

Core texts

Assessment

Attendance