

## Computer Aided Design

### Mechanical design and optimisation

#### IDENTIFICATION

CODE : GM-5-S2-EC-CECOP  
ECTS : 3.0

#### HOURS

Lectures : 0.0 h  
Seminars : 30.0 h  
Laboratory : 0.0 h  
Project : 0.0 h  
Teacher-student  
contact : 30.0 h  
Personal work : 10.0 h  
Total : 40.0 h

#### ASSESSMENT METHOD

Report and case studie

#### TEACHING AIDS

Slides [pdf]

#### TEACHING LANGUAGE

French

#### CONTACT

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#### AIMS

In the design phase, the BE engineer must master the prismatic or surface geometric definition of the products. He must ascertain at the earliest possible feasibility of manufacture, geometric quality and material.

This module makes it possible to master the various links of the geometric digital chain of the mechanical products of the BE to the service quality. The mastery of the surface design tools from a specification or an existing product in surface retro-design. Proficiency in 3D scanning and imaging tools for product design assistance and proficiency topologic optimisation softs.

#### CONTENT

- DESIGN AND TOPOLOGic optimization (2h cours + 4h of TD + 4h Projet) - Nadine NOEL
- Optimized geometry definition from stress conditions
- INSPIRE optimization tools, case study for mass optimization, stiffness, natural frequency.
- Optimization from the point of view of the process - additive manufacture or foundry
- SURFACIC CAD (2h of course + 4h TD + 4h Project) - Michele GUINGAND
- Generative Shape Design workshop
- Imagine and Shape/Free style workshops
- 3D SCANNING AND SURFACIC RETROCONCEPTION (2h of course + 4h TD + 4hTP) - Stéphane RAYNAUD and Adrien CHOUVIER
- Acquisition of laser scanner on measuring arm, MMT, large dimension scanner
- Processing, Filtering, Resetting Clouds, AC (As constructed)
- STL mesh
- Retro surface design with DSE (Digitalized Shape Editor) and QSR (Quick Surface Reconstruction) workshops

#### PRE-REQUISITE

Bachelor in Mechanical Engineering