



## SAVOIR CHOISIR UN MATÉRIAU

### SELECTION OF MATERIALS

Lecturers: Vincent FRIDRICI

| Lecturers : 14.0 | TC : 2.0 | PW : 0.0 | Autonomy : 4.0 | Study : 4.0 | Project : 8.0 | Language : AN

#### Objectives

The objectives of this AF are to provide students with methodological inputs on the selection of materials. This requires a good knowledge of the properties of the materials (some common core reminders are given) and needs setting up selection criteria, applied on a materials database. The Granta EduPack material selection software will be presented and used.

The course will be complemented by presentations by industry speakers on the selection of materials related to design, life cycle assessment and the environmental impact of products and materials.

A work in autonomy in group will be realized on a subject chosen by the students.

**Keywords :** materials, selection, selection methodology, Granta EduPack software

#### Programme

- material selection methodology
- selection criteria and material selection software Granta EduPack
- synthetic analyzes of the major families of materials and their properties
- life cycle assessment and environmental impact
- development of specific industrial case studies chosen in fields of activity using a wide range of materials: metals and alloys, polymers and composites, ceramics
- sessions are also devoted to the restitution of the work carried out by students in autonomy, on subjects related to materials and their place in the world today

#### Learning outcomes

- know how to select a material: drawing up and analyzing the specifications, developing criteria, researching materials and analyzing the results
- use and deepen the knowledge acquired in common core
- collect and analyze data with logic and method
- ability to give oral presentation and prepare written report about work in autonomy and in group

#### Independent study

- Objectifs :**
- implement a material selection approach for a given application
  - deepen the study of the properties of materials

**Méthodes :** Work in groups of 3 students: bibliographic survey, analysis of a specification, use of Granta EduPack software, ...  
Submission of a written report and oral presentation

#### Core texts

M. Ashby, *CHOIX DES MATÉRIAUX EN CONCEPTION MÉCANIQUE*, Dunod, 2012  
M. Colombié *MATÉRIAUX MÉTALLIQUES*, Dunod, 2000  
M. Ashby *MATÉRIAUX ET ENVIRONNEMENT : CHOIX ÉCO-RESPONSABLE EN CONCEPTION*, Dunod, 2011

#### Assessment

Note = 30% know + 70% know-how  
Know = 100% final exam  
Know how = 100% continuous assessment