FSAB1503 Project 3

[0h+60h exercises] 5 credits

This course is taught in the 1st semester

Teacher(s):	Patrick Bertrand (coord.), Francis Delannay, Jacques Devaux, Vincent Legat
Language:	French
Level:	First cycle

Aims

To master the understanding and the elaboration of a simple material device, which functioning is conditioned by the physical and chemical properties. The project integrates the disciplinary objectives of the " Chemistry ", " Physics " and " Mathematics " matters.
To discover the industrial dimension of the engineer profession.
To discover the experimental dimension of the engineer profession so as the links between experimental and theory.
To understand the notions of industrial processes intervening in the materials elaboration.
Deeply treated - Methodological objective
To use the different available languages (mother tongue, mathematical language, graphical languages) to efficably communicate as of function of the aimed objective (i.e.: principle description as detailed specification).
To use models both for a descriptive and predictive aims.
To plan together the tasks to perform by sharing the work in a way such that everybody is able to reach the learning objectives.

Main themes

In this project, the students will:
-Study industrial processes allowing organic, inorganic or metallic materials elaboration, considering their several aspects.
-Conceive elements of the processes on the basis of the technical and economic constrains.
-Conceive and model simple experiment devices, based on the materials combination thanks to the notions seen in the frame of the Physics and the Chemistry courses. If possible, these devices will be elaborated and tested.

Content and teaching methods

(Non limited) examples of the subjects treated in the frame of the project are given below:
Medium voltage electrical cable or coaxial high frequency cable containing a conductor core, a polymer insulator and a shield.
An electromagnetic wave shield of a plastic electrical box, obtained by metallic layers deposition of conductive fiber dispersion in a polymer.
An electrical battery mode with different metals and a polymer gel.
In all these cases, a part of the processes intervening in the elaboration of the device constitutive materials will be studied. The devices will be modeled on the basis of the notions seen during the lectures. The devices will be at least partly realised and tested in the frame of laboratories. The working methods will be based on active learning in tutored groups.

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Depending on the subjects, the prerequisites are different.
Generaly, the competences acquired in Chemistry, Physics and Mathematics during the first year of baccalaureate are required.
Some objectives of the matters seen during Q3 are integrated into the project : The " Chemistry " matter objectives related equilibria (including thermodynamics aspects) and to kinetics.
The " Physics " matter objectives related to waves. For the " Mathematics " matter, the objectives related to the differential equations and partials derivatives.

Other credits in programs

FSA12BA	Deuxième année de bachelier en sciences de l'ingénieur, orientation ingénieur civil	(5 credits)	Mandatory