

5.0 credits	30.0 h + 30.0 h	1q
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Teacher(s) :	Gonze Xavier ; Rignanese Gian-Marco ; Charlier Jean-Christophe ; Raskin Jean-Pierre (coordinator) ;
Language :	Français
Place of the course	Louvain-la-Neuve
Prerequisites :	<p>According to the themes, prerequisites will be different., although as a general rule, it will be requested to have the skills gained during the first year of Bachelor in chemistry, physics and mathematics.</p> <p>Some objectives linked to subjects studied in "Q3" (i.e. 2nd year, Fall Semester) will be integrated to the project:</p> <ul style="list-style-type: none"> <li>-- Objectives in the "Chemistry" field related to equilibria (including thermodynamics aspects) and to kinetics.</li> <li>-- Objectives in the " Physics " field related to waves and basic notions of quantum mechanics.</li> <li>-- In the " Mathematics " field, objectives related to the differential equations and partials derivatives, as well as the use of numerical simulation software MATLAB.</li> </ul>
Main themes :	<p>In this project, according to the set of themes, students will:</p> <ul style="list-style-type: none"> <li>-- Study industrial processes allowing to elaborate organic, inorganic or metallic materials, under all their different aspects.</li> <li>-- Conceive some elements of these processes based on technical and economical constraints.</li> <li>-- Conceive and model basic experimental devices, based on the materials combination thanks to some notions presented in the frame of Physics and Chemistry courses.</li> <li>-- As far as possible, these devices will be elaborated and tested.</li> </ul>
Aims :	<p>General objectives of the project:</p> <ul style="list-style-type: none"> <li>-- To gain an understanding and the ability to develop a simple material device, which functioning is conditioned by physical and chemical properties. The project integrates academic objectives of the "Chemistry", "Physics" and "Mathematics" subjects.</li> <li>-- To discover the industrial dimension of the engineer profession.</li> <li>-- To discover the experimental and numerical modelling dimension of the engineer profession, and be able to make the link between experiments and theory.</li> </ul> <p>In-Depth Methodological objectives:</p> <ul style="list-style-type: none"> <li>-- To use the different available languages (mother tongue, mathematical, graphical languages) in order to efficiently communicate according to the objective aimed at (e.g. standard description or detailed specification).</li> <li>-- To use models both for a descriptive and predictive purpose</li> <li>-- To plan together tasks to carry out by sharing the work in such way that everyone is able to reach the learning objectives.</li> </ul> <p><i>The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".</i></p>
Content :	<p>Some examples of the subjects studied 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 or conductive fiber dispersion in polymer. - An electrical battery, made with different metals and a polymer gel.</p> <p>In the frame of this project, students will have the opportunity to visit Belgian companies and research centers which activities are related to this project's field.</p>
Other infos :	<p>Depending on the subjects, the prerequisites are different. Generally, 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.</p>
Cycle and year of study :	> <a href="#">Bachelor in Engineering</a>
Faculty or entity in charge:	BTCI