

5.0 credits	45.0 h + 30.0 h	1+2q
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Teacher(s) :	Fisette Paul (coordinator) ; Matagne Ernest ; Raucent Benoît ;
Language :	Français
Place of the course	Louvain-la-Neuve
Main themes :	<ul style="list-style-type: none"> <li>- Analysis and description of a given technological problem</li> <li>- Submission of a pilot project and performance evaluation</li> <li>- Mechanical and electromechanical component dimensioning</li> <li>- Taking technical and safety norms into consideration</li> <li>- Presentation and defense of a complete and realistic technological solution</li> <li>- Drawings of the manufacturing plans and design of an autonomous</li> </ul>
Aims :	<ul style="list-style-type: none"> <li>- Introduce students, via practice, to develop mechatronic engineering projects</li> <li>- Foster creativity and solution seeking</li> <li>- Promote a synthetic spirit and combining material learned by solving a real problem</li> <li>- Allow students to construct a mechatronic prototype : a mobile robot</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>Students must take charge all the aspects of a proposed design problem. They particularly see to proposing innovative and technically correct solutions. The project will be advanced as far as possible including scale models, a final prototype and manufacturing plans for mechanical parts.</p> <p>The project starts in September and ends during the month of May. It is done in groups and involves the following steps :</p> <ul style="list-style-type: none"> <li>- Problem analysis and writing the specification conditions</li> <li>- Seeking original solutions</li> <li>- Quantification of the performances of each of the variants</li> <li>- Solution selection (i.e. choosing the best variant)</li> <li>- Presentation of the pilot project</li> <li>- Mechanical and electromechanical component dimensioning</li> <li>- Short economic study</li> <li>- Drawings of the manufacturing plans of parts to be built in the workshop</li> <li>- Private defense of the project and public of robot performance</li> </ul>

<p>Other infos :</p>	<p>Prerequisite :</p> <p>The project combines elements from the courses of mechanical design, electronics, computer science (real-time computing) , sensors and actuator control</p> <p>References :</p> <ul style="list-style-type: none"> <li>- RC. Juvinall and KM Marshek, Fundamentals of Machine Component Design, Wiley and Sons</li> <li>- Technical documentation and Manufacturers' catalogues</li> </ul> <p>Organisation :</p> <ul style="list-style-type: none"> <li>- Unlike the mechanical design project (MECA 2840), the subject of this course (MECA2845) is imposed by the teachers.</li> <li>- Groups : students work in groups of at least four. Before the pilot project, the group works together. Then, each one can specialize on a particular aspect.</li> <li>- Schedule : Two to Four hours of consultation are foreseen each week all year.</li> <li>- Accompaniment : besides the professors of the courses involved, each group has a tutor who will follow it all year. For that matter, the students are accompanied and aided by technical personnel of divisions PRM, LEI and DICE to construct the final robot.</li> <li>- Locale : students have the mechatronic room at their disposal (Bâtiment Maxwell) equipped with mechanical tools and electronic and computing equipment. The guarantee for this equipment for the academic year involves a deposit to be determined (amount and time limit) will be set by the project coordinator at the beginning of the year.</li> </ul> <p>Grading criteria :</p> <ul style="list-style-type: none"> <li>- Principally based on presentations and technical reports done during the year and the robot built. Grading of course MECA 2845 involves three aspects : quality of the pilot project (including the design of a scale models before the final prototype)</li> <li>- Mechanical design of the prototype (including the choice of materials, components, their dimensioning and manufacturing and assembly plans)</li> <li>- Combining the disciplines involved (mechanics, actuator control, electronics, sensors, real-time computing)</li> </ul> <p>N.B.: the other non MECA disciplines involved will be graded separately, in the context of an associated course</p>
<p>Cycle and year of study :</p>	<p><a href="#">&gt; Master [120] in Electro-mechanical Engineering</a></p>
<p>Faculty or entity in charge:</p>	<p>MECA</p>