

5.0 credits	30.0 h + 30.0 h	2q
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Teacher(s) :	Legat Jean-Didier ; Lobelle Marc ;
Language :	Anglais
Place of the course	Louvain-la-Neuve
Inline resources:	<p>&gt; <a href="http://www.foditic.org/">http://www.foditic.org/</a></p> <p>&gt; <a href="http://moodleucl.uclouvain.be/">http://moodleucl.uclouvain.be/</a></p>
Prerequisites :	<p>--</p> <p>General knowledge of electronics (for instance ELEC 2752 ELEC 2531).</p> <p>--</p> <p>Passive technical english</p>
Main themes :	<p>--</p> <p>Specific aspects of real-time software : specific concepts, design method, specific functions and algorithms of real-time operating systems, fault tolerance</p> <p>--</p> <p>Implementation of small computing systems based on microprocessors</p> <p>--</p> <p>Programming real-time systems</p>
Aims :	<p>--</p> <p>To be able to design both the software and hardware aspects of real-time systems.</p> <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>
Evaluation methods :	<p>--</p> <p>The project performed during the semester is evaluated and taken into account in the course marks.</p> <p>--</p> <p>An C test is organized early March. Where appropriate, this note could replace the result to question C of the exam.</p> <p>--</p> <p>Written exam with open books.</p>
Teaching methods :	<p>--</p> <p>Traditional lectures or distance learning</p> <p>--</p> <p>Students will have to design in group a real-time control system. For students in electromechanical engineering, this activity is integrated in a mobile robot project. Students in computing or electronics provide own projects.</p>
Content :	<p>--</p> <p>Software aspects</p> <p>--</p> <p>Introduction to real-time systems</p> <p>--</p> <p>Software design and implementation methods for real-time systems</p> <p>--</p> <p>Real-time operating systems</p> <p>--</p> <p>Programming in C</p> <p>--</p> <p>Fault tolerance</p> <p>--</p> <p>Hardware aspects</p> <p>--</p> <p>Introduction to digital electronic systems (logical circuits families, programmable circuits, memories)</p> <p>--</p> <p>Microprocessor architecture</p> <p>--</p> <p>Main peripheral circuits of a computing system (interrupt controllers, direct memory access controllers,...)</p> <p>--</p>

	Communication systems (PCI bus)
Bibliography :	<p>Recommended reading</p> <p>--</p> <p>D.A. Patterson, J.L. Hennessy, "Computer organization &amp; design. The hardware/software interface" , Morgan Kaufmann, 1994, 1-55860-282-8.</p> <p>--</p> <p>P.A. Laplante, "Real-time systems design and analysis. An engineer's handbook" , IEEE Press, 1993, 0-7803-0402-0.</p> <p>--</p> <p>A. Burns, A. Wellings, "Real-Time Systems and Programming Languages" , Addison Wesley, 1997, 0-201-40365-X. * A. M. van Tilborg, "Foundations of Real-Time Computing: Formal Specifications and Methods" , Kluwer, 1991, 0-7923-9167-5.</p> <p>--</p> <p>A. M. van Tilborg, G. M. Koob, "Foundations of Real-Time Computing: Scheduling and Resource management" , Kluwer, 1991, 0-7923-9166-7.</p> <p>--</p> <p>The C programming language, B. Kernighan and D. Ritchie, Prentice-Hall, 1988</p>
Cycle and year of study :	<p><a href="#">&gt; Master [120] in Computer Science and Engineering</a></p> <p><a href="#">&gt; Master [120] in Computer Science</a></p> <p><a href="#">&gt; Master [120] in Electro-mechanical Engineering</a></p> <p><a href="#">&gt; Master [120] in Electrical Engineering</a></p>
Faculty or entity in charge:	INFO