


2 credits

15.0 h + 15.0 h

Q2

Teacher(s)	Jeanmart Hervé ;
Language :	French
Place of the course	Louvain-la-Neuve
Main themes	Introduction to the operation and functional analysis of test benches of thermal machines and to the related metrology. Implementation of test benches of internal combustion engines for their thermodynamic, energetic and environmental characterisation.
Aims	<p>In consideration of the reference table AA of the program "Masters degree in Mechanical Engineering", this course contributes to the development, to the acquisition and to the evaluation of the following experiences of learning</p> <ul style="list-style-type: none"> <li>• AA1.1, AA1.2, AA1.3</li> <li>• AA2.1, AA2.2, AA2.4</li> <li>• AA3.2, AA3.3</li> <li>• AA5.4, AA5.5, AA5.6</li> <li>• AA6.1, AA6.2</li> </ul> <p>Learn experimental methods for the determination of energy and materials fluxes characteristic of thermal machines and equipments. Develop skills allowing students to control the operation of complex systems, including the security issues.</p> <p>-----</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>
Content	<p>This course is based on the personal confrontation to fundamental experimental techniques related to thermal machines and equipments. It includes three successive activities :</p> <ol style="list-style-type: none"> <li>1. General introduction: Functional study of the main parts of a test bench and implemented metrology principles: brakes, flow metering, thermometry, fast pressure acquisition, gaseous effluents analysis.</li> <li>2. Identification of available equipments on the different test benches and acquisition of independence in their use.</li> <li>3. Tests carried-out in small independent teams and treating of - acquisition and analysis of pressure diagrams :                         <ul style="list-style-type: none"> <li>- thermodynamic optimisation: spark advance mechanism and breathing - determination methods of mechanical dissipations - external characteristics acquisition</li> <li>- partial loadings and simulation of an engine use on a vehicle - total energetic balance and application to cogeneration</li> <li>- air-fuel ratio and analysis of combustion effluents</li> <li>- characteristics of the supercharging.</li> </ul> </li> </ol> <p>The realisation of personal trials is aided by instructions that must be pre-read. The technical staff checks that security rules are respected and can help and advise students.</p>
Inline resources	<a href="http://icampus.uclouvain.be/claroline/course/index.php?cid=MECA2240">http://icampus.uclouvain.be/claroline/course/index.php?cid=MECA2240</a>
Faculty or entity in charge	MECA

<b>Programmes containing this learning unit (UE)</b>				
Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Electro-mechanical Engineering	ELME2M	2		
Master [120] in Mechanical Engineering	MECA2M	2		