UCLouvain

lmeca2220

2017

Internal combustion engines

5 credits	30.0 h + 30.0 h	Q2

Teacher(s)	Jeanmart Hervé ;
Language :	English
Place of the course	Louvain-la-Neuve
Main themes	Components analysis, thermodynamics and general mechanics, energetic study, basic gauging, calculation of performances and diagnostic principles. Use of fuels and analysis of their combustion in engines: physicochemical, technological, energetic and environmental aspects
Aims	1 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: • AA1.1, AA1.2, AA1.3 • AA2.1, AA2.3, AA2.5 • AA3.1, AA3.2 • AA5.3, AA5.4, AA5.6 • AA6.1, AA6.2, AA6.3 Provide an analytical description of the functioning of internal combustion engines, as well as the principles of the evaluation of their performances and their basic gauging. Develop the capacity to integrate the various branches of mechanics allowing to structure the description of internal combustion engines, to master its conceptual aspects and to model its behaviour. - - - - *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".*
Content	The course is composed of two parts: **1. Components analysis, thermodynamics and general mechanics:** - main kinematics chain and functional auxiliaries - thermodynamics cycles, parietal effects, energy fluxes - breathing: operation modes, suction and supercharging - frictions, general architecture, main dimensions. **2. Use of fuels:** - combustibility properties and studies of combustion modes - study of abnormalities and optimisation of combustion laws - supercharging technology and control of polluting emissions. The first part of the presentation gives the necessary bases for the calculations carried out during tutorials under the form of exercises or case studies. The tutorials integrate in parallel the technological aspects of the second part of the course.
Inline resources	http://icampus.uclouvain.be/claroline/course/index.php?cid=MECA220
Bibliography	Livre de référence pour le cours . R. van Basshuysen, F. Schäfer, Internal Combustion Engine Handbook. Basics, Compontents, Systems, and Perspectives, SAE International, 2002. . C. R. Ferguson, Internal Combustion Engines. Applied Thermosciences, John Wiley & Sons, 1986. . J. B. Heywood, Internal Combustion Engine Fundamentals, McGraw-Hill Book Company, 1988. . R. Stone, Introduction to International Combustion Engines, 4th Edition, Palgrave Macmillan, 2012.
Other infos	Syllabus du cours disponible au SICI
Faculty or entity in charge	MECA

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Electro-mechanical Engineering	ELME2M	5		
Master [120] in Mechanical Engineering	MECA2M	5		