UCLouvain

lmeca2550

2021

Aircraft propulsion systems.

5.00 credits	30.0 h + 30.0 h	Q1

Teacher(s)	Chatelain Philippe ;Moens Maud (compensates Chatelain Philippe) ;
Language :	English
Place of the course	Louvain-la-Neuve
Main themes	1. Fundamentals of air-breathing propulsion 1.1) Dynamical and energetic aspects 1.2) Concepts and domains of use 2. Analysis of propulsion systems 2.1) The airscrew 2.2) The jet engine 2.3) The Ramjet and Scramjet engines 2.4) Inlets and nozzles 2.5) Technological aspects 3. Advanced concepts and future trends
Learning outcomes	**At the end of this learning unit, the student is able to :** 1 In consideration of the reference table AA of the program " Master's degree civil engineer mechanics ", 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, AA2.2, AA2.3 • AA3.1, AA3.2 • AA5.4, AA5.5, AA5.6 • AA6.3, AA6.4 Aims to provide an analytical description of systems used in aircraft propulsion, to model their behaviour and to introduce students to performance evaluation and component dimensioning.
Evaluation methods	The final evaluation is based on a written exam and homework/laboratory report marks. The homework assignments and laboratory activities are mandatory, and individual unless announced otherwise. A report must be produced for each within a specified time frame and the marks are definitive (these assignments cannot be retaken). The exam is subdivided into 2 parts: • theory • practical exercises : performance evaluation and system design In case of technical issues or in case of fraud suspicion, the lecturers may reserve the right to replace the written exam by an oral exam.
Teaching methods	Course notes are being prepared and will be made available in electronic format during the term. Lecture slides will also be available
Content	1. Fundamentals of air-breathing propulsion 1.1) Dynamical and energetic aspects 1.2) Concepts and domains of use 2. Analysis of propulsion systems 2.1) The airscrew 2.2) The jet engine 2.3) The Ramjet and Scramjet engines 2.4) Inlets and nozzles 2.5) Technological aspects 3. Advanced concepts and future trends

Inline resources	http://moodleucl.uclouvain.be/enrol/index.php?id=8367
Other infos	Lectures: • Fluid mechanics and transfer phenomena (LMECA1321) • Thermodynamics and energetics (LMECA1855) • Fluid mechanics and transfer II (LMECA2322) : can be followed concurrently • Aerodynamics of external flows (LMECA23232) : optional as it is complementary Programming skills: Matlab or Python
Faculty or entity in charge	MECA

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Mechanical Engineering	MECA2M	5		
Master [120] in Electro-mechanical Engineering	ELME2M	5		