


5.00 credits	30.0 h + 30.0 h	Q1
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Teacher(s)	Chatelain Philippe ;
Language :	English
Place of the course	Louvain-la-Neuve
Main themes	<ol style="list-style-type: none"> 1. Fundamentals of air-breathing propulsion <ol style="list-style-type: none"> 1.1) Dynamical and energetic aspects 1.2) Concepts and domains of use 2. Analysis of propulsion systems <ol style="list-style-type: none"> 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	<p>At the end of this learning unit, the student is able to :</p> <p>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:</p> <ul style="list-style-type: none"> • 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 <p>1</p> <p>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.</p>
Evaluation methods	<p>The final evaluation is based on a written exam and homework/laboratory report marks. The homework assignments and laboratory activities are <u>mandatory</u>, 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:</p> <ul style="list-style-type: none"> • theory • practical exercises : performance evaluation and system design <p>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.</p>
Teaching methods	<p>Course notes are being prepared and will be made available in electronic format during the term. Lecture slides will also be available</p>
Content	<ol style="list-style-type: none"> 1. Fundamentals of air-breathing propulsion <ol style="list-style-type: none"> 1.1) Dynamical and energetic aspects 1.2) Concepts and domains of use 2. Analysis of propulsion systems <ol style="list-style-type: none"> 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

<p>Inline resources</p>	<p>http://moodleucl.uclouvain.be/enrol/index.php?id=8367</p>
<p>Other infos</p>	<p>Lectures:</p> <ul style="list-style-type: none"> • 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 <p>Programming skills: Matlab or Python</p>
<p>Faculty or entity in charge</p>	<p>MECA</p>

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		