



5.00 credits

30.0 h + 30.0 h

Q2

Teacher(s)	Bricteux Laurent ;Lavagnoli Sergio ;
Language :	English > French-friendly
Place of the course	Louvain-la-Neuve
Main themes	The main focus of these lectures is directed towards axial steam and gas turbines. The description of radial gas turbines, as well as their operation, is of less importance. A short description of hydraulic machines ends the lectures.
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 1 • AA2.1, AA2.2, AA2.3 • AA3.1, AA3.3 • AA5.1, AA5.2, AA5.5, AA5.6 • AA6.1, AA6.2 <p>Explain the fundamental principles of design and operation of axial and radial turbomachines (turbines)</p>
Evaluation methods	<p>In this course, the students are evaluated in two ways:</p> <ul style="list-style-type: none"> - An oral closed-book exam (part A) - A mandatory project work, to be delivered by the end of the first session (part B). <p>The final grade is the weighted average of part A and part B evaluations. In the final grade, Part B weights 40%, while Part A weights 60%.</p> <p>If no project is submitted, the student will be considered as absent for the whole evaluation. No project is organized during the August second session.</p> <p>A minimal note of 9/20 must be obtained at the exam for the note of the project to be used in the final note; otherwise, only the exam note is reported as the final note; the note for the project is still acquired by the student and it will be used, together with the note of an exam in the next session, to compute the new final note.</p>
Content	<p>Part I: Turbomachinery basics: Introduction and applications</p> <p>Part II: Common concepts: Thermodynamics, compressible flows, kinematics, radial equilibrium</p> <p>Part III: Compressors: Axial flow compressors, radial flow compressors</p> <p>Part IV: Turbines: Axial flow turbines, technological aspects of gas turbines, technological aspects of steam turbines</p>
Inline resources	https://moodle.uclouvain.be/enrol/index.php?id=742
Bibliography	<ul style="list-style-type: none"> • J.H. Horlock, Axial Flow Turbines, London Butterworth Scientific Publications • O.E. Balje, Turbomachines, A Guide to Design and Theory, John Wiley • W. Traupel, Thermische Turbomaschinen, Springer Verlag. • S. Korpela, Principles of Turbomachinery 2nd Edition, John Wiley • S. Dixon, C. Hall, Fluid Mechanics and Thermodynamics of Turbomachinery, Sixth Edition, Butterworth-Heinemann
Other infos	mandatory visits to relevant companies or research centers will be organized.
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		
Master [120] in Energy Engineering	NRGY2M	5		