


3 credits

20.0 h

Q2

Teacher(s)	Soares Frazao Sandra ;
Language :	English
Place of the course	Louvain-la-Neuve
Main themes	<ul style="list-style-type: none"> • Hydropower in the global context of energy • Identification of exploitable sites • Principles of hydraulic machinery and pre-design of turbines • Hydraulic transients and surge tanks • Local production and use of hydropower in developing countries
Aims	<p>Contribution to the acquisition and evaluation of the following learning outcomes of the programme in civil engineering: AA1.2, AA1.3, AA2.1, AA2.2, AA4.1</p> <p>More specifically, at the end of the course, the student will be able to:</p> <p>1</p> <ul style="list-style-type: none"> • Identify and characterize exploitable sites • Design a multipurpose installation • Design penstocks and surge tanks • Understand the choice of the turbines and their consequences <p>Transversal learning outcomes: discuss the question of energy, and in particular renewable energy, in the world</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>
Evaluation methods	Oral examination
Teaching methods	Ex-cathedra teaching with examples of practical cases
Content	<p>1. Hydropower in the world : past, present and future</p> <ul style="list-style-type: none"> • Selection criteria for exploitable sites • Definiton of the potential of a given site • Geological and hydrogeological context <p>2. Hydraulics and and hydropower :</p> <ul style="list-style-type: none"> • Fundamental notions : energy, efficiency, momentum • Headlosses in the hydraulic circuit • Water hammer and penstocks • Surge tanks <p>3. Hydraulic turbines :</p> <ul style="list-style-type: none"> • Classification and general design • Similitude and specific turbine • General design of a hydropower plant <p>4. Alternator and power regulation</p> <p>5. Micro-hydropower, hydropower in developing countries</p> <p>6. Economical aspects</p>
Inline resources	Available on Moodle
Other infos	While oriented toward civil engineering design of hydropower plants, the course is open to students of other disciplines
Faculty or entity in charge	GC

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Civil Engineering	GCE2M	3		
Master [120] in Architecture and Engineering	ARCH2M	3		