

Due to the COVID-19 crisis, the information below is subject to change, in particular that concerning the teaching mode (presential, distance or in a comodal or hybrid format).

4 credits

20.0 h + 15.0 h

Q1

Teacher(s)	Soares Frazao Sandra ;
Language :	English
Place of the course	Louvain-la-Neuve
Main themes	<ul style="list-style-type: none"> <li>• Determination of design floods</li> <li>• Management and operation of reservoirs and floodplains</li> <li>• Simplified flood propagation modelling</li> <li>• Introduction to the problematics of droughts</li> </ul>
Aims	<p>Contribution to the acquisition and evaluation of the following learning outcomes of the programme in civil engineering: AA1.1, AA1.2, AA1.3, AA2.1, AA2.2, AA2.3, AA2.4, AA2.5, AA3.1, AA3.3, AA5.2, AA5.3, AA5.5, AA5.6, AA6.2.</p> <p>More specifically, at the end of the course, the student will be able to:</p> <ul style="list-style-type: none"> <li>• Determine the extreme discharges for the design of spilling systems and flood mitigation plans;</li> <li>• Design flood retention reservoirs;</li> <li>1 • Model the propagation of floods in a simplified way;</li> <li>• Determine the characteristics of drought events</li> </ul> <p>Transversal learning outcomes:</p> <ul style="list-style-type: none"> <li>• Links with events occurring in the world and critical assessment of those;</li> <li>• Water resource management;</li> <li>• Link technical and social aspects of flood mitigation planning</li> </ul> <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	<p><b>Due to the COVID-19 crisis, the information in this section is particularly likely to change.</b></p> <p>The evaluation takes place in two parts:</p> <ul style="list-style-type: none"> <li>• Continuous evaluation through regular assignments on the different topics of the course. Each assignment leads to a report or a presentation that is discussed with the professor during the exam session. This parts counts for 60 % of the final mark.</li> <li>• An oral examination about the theoretical concepts taught in the course. This part counts for 40 % of the final mark. If the students fails this part, the weight is increased linearly toward 100 % for a mark lower than 8/20 for the oral part.</li> </ul>
Teaching methods	<p><b>Due to the COVID-19 crisis, the information in this section is particularly likely to change.</b></p> <p>Lectures for teh theory and practical applications of teh course topics on real cases through homeworks or projects. The course is given in the calssroom or online, depending on the number of registered students.</p>
Content	<ol style="list-style-type: none"> <li>1. The question of floods and inundations                     <ul style="list-style-type: none"> <li>• Origin of floods</li> <li>• Natural and man-inducing causes</li> </ul> </li> <li>2. Pre-determination of flood discharges                     <ul style="list-style-type: none"> <li>• Empirical methods (historical methods, or based on the watershed dimensions)</li> <li>• Statistical methods (extreme value distributions)</li> <li>• Gradex method: rainfall-discharge relation for extreme rainfalls</li> </ul> </li> <li>3. Flood control                     <ul style="list-style-type: none"> <li>• Retention reservoirs and flood attenuation</li> <li>• Reservoir exploitation: flow mass curve, stochastical simulation (Fiering)</li> <li>• Reservoir sedimentation</li> <li>• Flood control for hydropower reservoirs</li> </ul> </li> </ol>

	<p>4. Flood protection measures</p> <ul style="list-style-type: none"><li>• Watershed</li><li>• Floodplains</li></ul> <p>5. Flood propagation</p> <ul style="list-style-type: none"><li>• Hydrological methods (Muskingum)</li><li>• Methods of cells</li></ul>
Inline resources	Moodle site for the course, with lecture slides and notes, and other useful documents.
Bibliography	
Faculty or entity in charge	GC

<b>Programmes containing this learning unit (UE)</b>				
Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Civil Engineering	GCE2M	4		