lgciv2015

2022

Roads and bridges

3.00 credits	30.0 h	Q2

Teacher(s)	Gilles Pierre ;Grégoire Colette ;Houdart Sébastien ;
Language :	English > French-friendly
Place of the course	Louvain-la-Neuve
Prerequisites	Basic knowledge of structural stability, steel and concrete structures, as taught in the courses LGCIV1022, LGCIV1023, LGCIV1032, LGCIV1072, LGCIV2071
Main themes	The course " Roads and bridges " covers a general introduction to the design and use of these structures . It presents the main concepts and the main criteria leading to different technical options during design. The sizing hypotheses are introduced. Details of calculation method are not always covered, but reference is made to related courses.
Learning outcomes	**At the end of this learning unit, the student is able to :** 1 Contribution to the acquisition and evaluation of the following learning outcomes of the programme in civil engineering: AA1.1, AA1.3, AA5.2, AA5.3, AA5.4, AA6.1, AA6.3 More specifically, at the end of the course, t he student will be able to: • Sketch a road structure and a bridge and choose the most appropriate technical solution for the final design, considering building process and environmental constraints.
Evaluation methods	Oral or written examination
Teaching methods	Ex cathedra presentations, combined with field visit of relevant civil w orks, completed or in progress and/or case study analysis
Content	**Roads :** • Types of roads • Structure of a road: role and characteristics of the different layers • Design • Road geotechnics : laboratory tests and in situ tests • Pavement drainage and soil treatment • Auscultation – pathologies • Maintenance **Bridges :** From maintenance to design. Nowadays a bridge engineer needs to know how a bridge behaves over time and how a bridge stock is managed. In this way he can design a new structure well. 1. Bridge types: Bridge types (slab bridge, beam bridge, rigid-frame bridge, arch bridge, stay bridge, suspension bridge, moveable bridge) and bridge materials. 2. Bridge Erection methods: Bridge erection methods either on site and in prefabrication plant (cast in place bridges, erection by displacement, prefabricated elements assembling, ...) with common span for each methods. 3. Specific bridge elements: Bearings, expansion joints, waterproofing, drainage system, pedestrian parapet, safety barrier, instrumentation, … 4. Pathologies: Presentation of bridge pathologies. Link will be made with technical prescriptions or details design that can reduce the impact of those pathologies. 5. Bridge management: Bridge management system concepts (bridge load testing, inspection, indicators, monitoring, ...). 6. Designing bridges: Design principles will be overview with a focus on the actions on bridges (dead loads, variable loads, accidental actions).
Inline resources	Available on Moodle
Bibliography	Slides, course summaries, reference texts, recommended reading as listed on Moodle

Faculty or entity in charge	GC

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Civil Engineering	GCE2M	3		🔍
Master [120] in Architecture and Engineering	ARCH2M	3		🔍