lgciv2041
2019

Numerical analysis of civil engineering structures

In view of the health context linked to the spread of the coronavirus, the methods of organisation and evaluation of the learning units could be adapted in different situations; these possible new methods have been - or will be - communicated by the teachers to the students.

4 credits	20.0 h + 15.0 h	Q2

Teacher(s)	Sgambi Luca ;
Language :	English
Place of the course	Louvain-la-Neuve
Main themes	Variational principles in structural mechanics, classical theory of finite elements for structures: · Trusses (2D and 3D) · Frames (2D and 3D) · Plates and shells · Plane stress and plane strains. More advanced material will eventually be covered: elasto-plastic modelling of frames, structural instabilities, modelling of brittle materials, lage displacements in structures. A computer project will be assigned to students that will consist in the development of a finite element code for a specific type of structure. The code will have to deal with inputs and outputs, including a graphical user interface.
Aims	**Contribution of the course to the program objectives (N°)** AA1.1, AA1.2, AA1.3, AA2.1, AA2.2, AA2.3, AA2.4, AA3.1, AA3.2, AA4.2, AA4.4, AA5.6. **Specific learning outcomes of the course** 1 • Students will understand the principles of the finite element method applied to usual civil engineering structures (beams, frames, plates and shells). • Students will be trained in programming the finite element method. This includes the treatment of input data and the post-treatment of the results. - - - - *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".*
Evaluation methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** Exam (40%) and computer project (60%).
Teaching methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** Classroom
Content	See "Main themes".
Bibliography	• Finite Element Structural Analysis, T.Y Yang, Prentice-Hall, Inc, Englewood, NJ, 1986 • Analyse des structures et milieux continus, volume 6 : Méthode des éléments finis, F. Frey et J. Jirousek, Presses polytechniques et universitaires romandes.
Faculty or entity in charge	GC

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Mechanical Engineering	MECA2M	5		🔍
Master [120] in Mathematical Engineering	MAP2M	5		🔍
Master [120] in Civil Engineering	GCE2M	4		🔍
Master [120] in Electro-mechanical Engineering	ELME2M	5		🔍