LAUCE2181

2010-2011

Mechanic of structures

2.0 credits	10.0 h + 15.0 h	1q

Teacher(s) :	Remacle Jean-François ;
Language :	Français
Place of the course	Louvain-la-Neuve
Main themes :	- Analysis of various classes of elastic structures - Static finite element analysis of structures, including elastic stability - Introduction to finite element softwares
Aims :	Given the precept of structure modeling (linear elasticity and static analysis) *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".*
Content :	- Structures * presentation and identification of different classes of structures - Modelling of elastic structures * one dimensional structures : beams, bars, rods, arcs * deformations due to shear strains: the Timoshenko beam * pane stress and plane strain states, membranes * thin plates (Kirchoff model) * thick plates (Reissner-Mindlin model) * thin shells - Finite Elements for Structures * introduction to the calculus of variations * variational principles in elasticity, energy principles, Cea's lemma, Hypercircle of Prager and Synge * finite element models for different classes of structures * special issues: shear locking, patch test, thin plates and C1 continuity, boundary conditions * numerical implementation using MATLAB - Numerical softwares * principles, functionalities * pre and post-processing, mesh generation * validation and verification, error estimation * applications
Other infos :	Naught
Cycle and year of study :	> Master [120] in Chemical and Materials Engineering > Master [120] in Mechanical Engineering > Master [120] in Architecture and Engineering > Master [120] in Electro-mechanical Engineering > Master [120] in Civil Engineering
Faculty or entity in charge:	GC