UCL Université catholique de Louvain

LMECA1201

2010-2011

Projet en modélisation et simulation (nouveau cours)

2.0 credits	20.0 h + 10.0 h	1q

Teacher(s) :	Samin Jean-Claude ; Fisette Paul ;
Language :	Français
Place of the course	Louvain-la-Neuve
Main themes :	To establish a relevant hypothesis in order to model a complex mechanical system. To exploit equations of the kinematics and dynamics of rigid bodies for the development of the model. To understand a specific law of behavior (example: tire/ground contact model) and incorporate it into the model. To implement the numerical methods necessary for finding an equilibrium configuration and performing a time simulation of the dynamic behavior of the modeled system. To present the results in a professional way, to interpret them and explain their limits in view of the chosen assumptions, the nature of the chosen model and the numerical methods implemented.
Aims :	By the end of the project, the students should be able to establish relevant hypotheses in order to model a complex mechanical system with a view to simulating its dynamic behavior and analyzing the results of that simulation. *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 :	Choice of a real example of a mechanical system, according to a particular topic suggested (e.g.: a vehicle, a motorbike, a fair machine) and collect useful data; Establishment of the relevant assumptions for development of a "multibody" model, according to the type of results and the analysis requested; Development and implementation of the multibody model using the symbolic software ROBOTRAN; Understanding and implementation via the multibody model of some specific laws of behavior (e.g.: contact model, control, particular space environment); Development of a Matlab program for the simulation and numerical analysis of the preceding model; Realization of a graphic model of the system using a CAD software and animation of the system on the basis of the simulations carried out; Interpretation of the results and critical analysis of the model which has been used: a written report plus an oral presentation of the results.
Other infos :	Prequisite: basic course in Classical Mechanics and Numerical Methods Format : practicals with groups of students Assessment : Year long involvement. Written report. Final interview.
Cycle and year of study :	> Bachelor in Engineering > Bachelor in Mathematics > Master [120] in Electro-mechanical Engineering
Faculty or entity in charge:	MECA