UCL Université catholique de Louvain

LINMA2370

2010-2011

Modelling and analysis of dynamical systems

5.0 credits	30.0 h + 22.5 h	1q

Teacher(s) :	Bastin Georges ;
Language :	Français
Place of the course	Louvain-la-Neuve
Main themes :	First part : presentation of the modelling principles and methods in various areas of engineering sciences : electricity, mechanics, chemical and biochemical processes, environment. Second part : presentation of the major methods for the analysis of the structural properties of state space models : state transformations, equilibria, stability and attractors, controllability, singular perturbations.
Aims :	Aims - To make the students aware of the unifying character of the state space model concept in engineering sciences. - To introduce the students to the principles of mathematical modelling, and to the methods of dynamical systems 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 :	MODELING - mechanical, electrical, electromechanical systems - compartmental systems - reactional systems - systematic applications in various areas ANALYSIS - state transformations - equilibria - qualitative analysis of trajectories in the plane, periodical solutions, limited cycles, bifurcations - stability analysis : Lyapunov methods - controllability and stabilisation of linear and nonlinear systems
Other infos :	no special information
Cycle and year of study :	> Master [120] in Chemical and Materials Engineering > Master [120] in Mathematical Engineering > Master [120] in Mechanical Engineering > Master [120] in Electro-mechanical Engineering > Master [120] in Biomedical Engineering
Faculty or entity in charge:	MAP