UCL Université catholique de Louvain

LINMA2300

2012-2013

Process Control

5.0 credits	30.0 h + 30.0 h	1q

Teacher(s) :	Dochain Denis ;
Language :	Français
Place of the course	Louvain-la-Neuve
Main themes :	The content of this course deals with the control of linear time invariant systems in the context of chemical engineering processes.
Aims :	The main themes considered in this course are : - the dynamics and stability of processes - the PID regulator - the feedforward control, the delay compensation and other more advanced control methods ; - the control of batch processes - the inferential control and the state observers. *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 :	The content of this course deals with the control of linear time invariant systems in the context of chemical engineering processes. In particular the notions of dynamical models and feedback loop will be considered. The notion of operator (implicitly connected to Laplace transform) will be used to transform differential equations into algebraic equations in order to introduce the concept of transfer functions that will ease the analysis and synthesis of controllers and closed-loop systems. The course will mainly concentrate on PID (proportional-integral-derivative) controllers, with reference to the IMC (internal model control) approach which is largely used in process control. The course will also consider topics like time-delay compensation, feedforward actions, ratio control and cascade control, and is open to topics like inferential control and state observers. The course is based in particular on the notions of mass and energy balances and of unit operations, and it is illustrated by examples drawn from applications in the process industry.
Other infos :	Written support : notes Reference book : Seborg D.E., T.F. Edgar and D.A. Mellichamp (2003). Process Dynamics and Control, 2nd edition, John Wiley, New York. Evaluation : final exam (75%); laboratories and homeworks (25%)
Cycle and year of study :	> Master [120] in Biomedical Engineering > Master [120] in Chemical and Materials Engineering > Master [120] in Mechanical Engineering
Faculty or entity in charge:	MAP