UCL Faculté des sciences appliquées

FSA

MAPR2145 Process Simulation

[30h+15h exercises] 4 credits

This course is taught in the 2nd semester

Teacher(s): Denis Dochain, Fernand Thyrion
Language: french
Level: 2nd cycle course

Aims

Introduction to simulation techniques, to flowsheeting and to process optimisation.

Main themes

1) Basic concepts
General structure and operating mode of a process simulation software. Flowsheeting methods. Evaluation and selection of thermodynamic, kinetic and unit operation models.
2) Mathematical tools
Numerical methods of integration of partial differential equations used in chemical engineering. Finite difference methods, Weighted residuals methods (orthogonal collocation).
3) Numerical simulation
Solution of a simulation flowsheet. Operation principles of a software (ASPEN). Generation of thermodynamic properties, use of a software for the design of equipments and the parameter sensitivity study. Simulation of the most important unit operations.
4) Optimisation
Application of optimisation methods to typical processes like heat exchangers, reactor cascade, distillation columns,#
Applied methods : nonlinear optimisation with constraints (e.g. generalised reduced gradient, sequential quadratic programming, Lagrange multipliers,#)

Other credits in programs

BIR22/2C	Deuxième année du programme conduisant au grade de bio-ingénieur : Chimie et bio-industries (Ingénierie biomoléculaire et cellulaire)	(4 credits)	Mandatory
INCH22	Deuxième année du programme conduisant au grade d'ingénieur civil chimiste	(4 credits)	Mandatory