LBRTI2102

2012-2013

Process modelling and forecasting systems

5.0 credits	30.0 h + 15.0 h	1q

Teacher(s) :	Hanert Emmanuel ;
Language :	Français
Place of the course	Louvain-la-Neuve
Prerequisites :	Prerequisites: basic courses in mathematics (MAT1111, BIR1200) and some knowledge of Matlab (BIR1204, BIR1305).
Main themes :	The course is focused on the use of models in decision support, with an accent on (1) the various methodologies in modelling, (2) their pertinence in a forecasting context and (3) the evaluation of the risk associated to their usage.
Aims :	During this course, students will acquire knowledge of existing modelling methodologies and will be acquainted to the use of deterministic and stochastic modelling tools. They will be made aware of the various steps involved in the implementation of operational simulation tools in a forecasting context. They will be able to take into account the propagation of errors and uncertainties in the model and manage the associated risk. *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".*
Evaluation methods :	Evaluation: Individual report on a practical work and oral exam during the exam session including a presentation of the report.
Teaching methods :	Material: Lecture notes and Matlab programs available on iCampus.
Content :	The course will focus on the following topics. Their presentation will involve both theoretical analysis and hands-on examples with the software Matlab. -- Dynamical population models. -- Transport models in 1D and 2D, and the numerical discretization of the advection-diffusion-reaction equation. -- Application of advection-diffusion-reaction models in hydrodynamics, surface runoff, bio-diffusion, epidemiology and climatology. -- Cellular-automata models and their application to model the spread of epidemics and invasive plants.
Bibliography :	Reading list available on iCampus.
Cycle and year of study :	> Master [120] in Chemistry and Bio-industries > Master [120] in Agricultural Bioengineering > Master [120] in Environmental Bioengineering > Master [120] in Forests and Natural Areas Engineering
Faculty or entity in charge:	AGRO