BRTI2102 Process modelling and forecasting systems

[22.5h+15h exercises] 3 credits

This course is taught in the 1st semester

Teacher(s):	Philippe Baret, Patrick Bogaert, Xavier Draye (coord.)
Language:	French
Level:	Second cycle

Aims

During this course, the student will acquire knowledge of existing modelling methodologies and will be acquainted to the use of deterministic and stochastic modelling tools. He will be aware of the various steps involved in the implementation of operational simulation in a forecasting context. He will be able to take into account the propagation of errors and uncertainties in the model and manage their existence in risk assessment.

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. The attention is also drawn on the methods of risk assessment in SME and in public management.

Content and teaching methods

The following topics are discussed and illustrated with pre- and operational case studies:
Modelling:
- Typology
- Methodologies
- Formulation languages (UML,#)

Forecasting:
- Typology of approaches and functions
- Methodology
- Statistics (scenario, Monte Carlo)
- Simulation and propagation of uncertainties
- Integration in an information system
- Case studies

Risk assessment:
- Implementation
- Quantitative evaluation of risk
- Role of modelling in the decision process

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

- Prerequistes: basic courses in statistics (including linear models), basic knowledge of the Matlab/Simulink environment.
- Evaluation: Part 0 (written, before session): individual report on a pratical work. Part 1 (written, in session): questions sorted from a known-in-advance list. Part 2 (oral, in session): discussion on the individual report.
- Course material: Powerpoint presentation and additional documents on the course website at iCampus (access restricted).
- Recommended readings: updated list available on the course website at iCampus.

For more information
Vade mecum available at www.iCampus.ucl.ac.be

Other credits in programs

BIR22/0E	Deuxième année du programme conduisant au grade de bio-ingénieur: Sciences et technologies de l'environnement (Technologies et gestion de l'information)	(3 credits)	Mandatory
BIR23/0A	Troisième année du programme conduisant au grade de bio-ingénieur: sciences agronomiques (Technologies et gestion de l'information)	(3 credits)	Mandatory
BIR23/0C	Troisième année du programme conduisant au grade de bio-ingénieur: chimie et bio-industries (Technologies et gestion de l'information)	(3 credits)	Mandatory
BIR23/0E	Troisième année du programme conduisant au grade de bio-ingénieur: sciences et technologies de l'environnement (Technologies & gestion de l'information)	(3 credits)	Mandatory