UCL Université catholique de Louvain

LBRAI2219

2014-2015

Systems Biology

3.0 credits	30.0 h	1q

Teacher(s) :	Draye Xavier ;
Language :	Français
Place of the course	Louvain-la-Neuve
Inline resources:	iCampus
Prerequisites :	Mathematics, informatics, biology, physiology and genetics (typ. masters BIRA et BBMC).
Main themes :	- Introduction to systems biology - Introduction to notions of dynamic and compartmentalized networks - Mathematical formalisms and software tools for the exploration of omics data - Initiation to modelling (practicals)
Aims :	a. Contribution of this activity to the program learning outcomes M1.1, M1.2, M2.2, M2.3, M3.1, M3.6, M4.4, M6.1, M6.3, M6.4 b. Learning outcome specifics for this activity At the end of the course, the student is able to : · approach the functioning of an organism in a systems framework and at multiple scales ; · explain the specifics of systems biology · recognise and understand a systems biology methodology · explore the litterature with professional databases (e.g. Scopus), contact and discuss with researchers in the field · present a subject in a synthetic and pedagocis way to the student room *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 :	Presentation of one or more seminar Evaluation of the participation to the class work
Teaching methods :	Presentation of one or more seminars Directed practicals (in classroom). Article reading, use of models or modeling languages.
Content :	Table of content 1. General view of systems biology Systems theory and biology Topology, graphs and network attributes Node identification and interactions mapping Network inference Data integration From structure to dynamics 2. Software tools for data mining of omics 3. Languages and case studies L-Systems (structure) and FSPM (structure-function) Interactions organism - environment Case studies at different scales (gene network, cell, tissue, organ, organism)
Bibliography :	Articles from litterature (uploaded on iCampus).
Cycle and year of study :	> Master [120] in Agricultural Bioengineering > Master [120] in Environmental Bioengineering
Faculty or entity in charge:	AGRO