

5.0 credits

30.0 h + 30.0 h

1q

Teacher(s) :	Bastin Georges ; Lefèvre Philippe ;
Language :	Français
Place of the course	Louvain-la-Neuve
Main themes :	<p>Main themes</p> <p>This course will first explain how to build a mathematical model in the biomedical field, from the basic laws of nature. It will describe how this design always implies an experimental approach aimed at getting data which will serve as a basis to develop the new model. The mathematical model will be presented as a tool allowing to explain the system's basic mechanism and allowing to predict the system behaviour when exposed to new stimuli.</p> <p>The different steps of the development of a new model will be explained: initial observation, hypothesis, model testing and validation. The different model types will be described and illustrated by examples: deterministic or stochastic; static, dynamic or chaotic; parametric or non-parametric; distributed or non-distributed.</p> <p>These notions will be illustrated by examples of mathematical models in the biomedical field: models in physiology, compartmental models, and population models.</p>
Aims :	<p>Aims</p> <ul style="list-style-type: none"> <li>- to understand the basic elements of biology required to conceive mathematical models</li> <li>- to understand and be able to model different categories of biological systems by using appropriate model types.</li> <li>- to make a documented choice between different model types according to the application.</li> <li>- to be able to use computer tools to implement the developed models and to simulate them numerically</li> </ul> <p><i>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".</i></p>
Content :	<p>Content and methods</p> <p>Introduction</p> <ul style="list-style-type: none"> <li>- To understand and model biological systems</li> <li>- Model designing, test and validation</li> <li>- Different types of models of biological systems</li> </ul> <p>Method: theoretical course and practical work.</p>
Other infos :	N / A
Cycle and year of study :	<ul style="list-style-type: none"> <li>&gt; <a href="#">Master [120] in Statistics: Biostatistics</a></li> <li>&gt; <a href="#">Master [120] in Mathematical Engineering</a></li> <li>&gt; <a href="#">Master [120] in Computer Science and Engineering</a></li> <li>&gt; <a href="#">Master [120] in Electrical Engineering</a></li> <li>&gt; <a href="#">Master [120] in Electro-mechanical Engineering</a></li> <li>&gt; <a href="#">Master [120] in Mechanical Engineering</a></li> <li>&gt; <a href="#">Master [120] in Biomedical Engineering</a></li> </ul>
Faculty or entity in charge:	EPL