



5 credits	30.0 h + 30.0 h	Q2
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Teacher(s)	Bogaert Patrick ;Hanert Emmanuel coordinator ;Vanclooster Marnik ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	<i>The prerequisite(s) for this Teaching Unit (Unité d'enseignement – UE) for the programmes/courses that offer this Teaching Unit are specified at the end of this sheet.</i>
Aims	<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>
Evaluation methods	The evaluation is based on a written exam for computer science part and on the group report and the oral presentation of the project. The final mark is the weighted average of these different elements.
Teaching methods	The teaching is based on lectures for the computer science part with practical work in the computer room. The project part is presented during a lecture. The students then work in groups of four. Practical sessions specifically dedicated to the project are also planned.
Content	<p>This course starts with an overview of the basic concepts of computer science. It covers the following concepts:</p> <ul style="list-style-type: none"> • Operations on vectors and matrices • Exchange of information through input/output statements • If/else, for, while, switch statements • Principles of modular programming • Logical operators and associated functions • Data structures in Matlab • Graphics and data visualization • Symbolic calculation in Matlab • Sorting, searching and indexing algorithms • Management of complex data files • Introduction to the python programming language <p>Students will then apply these concepts in a group project that will also include mathematical and statistical concepts seen in previous courses. This project mostly takes place in the computer room and has a significant personal work component. The study of a real case is proposed to groups of four students. It involves the following steps:</p> <ul style="list-style-type: none"> • Analysis of raw data and development of a program in Matlab to process the data files and make them usable for the following steps of the project. • Formulation of mathematical and statistical models describing the problem to be solved. • Description of a method for the numerical solution of the problem. • Programming in Matlab of the numerical algorithm. • Writing up by each group of a report and oral presentation of this report.
Inline resources	Moodle course site
Bibliography	Pour la partie informatique : notes de cours rédigées en anglais ainsi que de nombreux exemples de programmes Matlab disponibles sur le site Moodle du cours ainsi que des livres de référence sur le langage de programmation Matlab en nombreux exemplaires à la Bibliothèque des Sciences exactes. Pour la partie projet : fascicules, livre de référence, vade-mecum et instructions détaillées disponibles sur Moodle.
Other infos	The course does not use any particular support which would have to be paid and deemed obligatory. Any paid books that may be recommended are optional.
Faculty or entity in charge	AGRO

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Bachelor in Geography : General	GEOG1BA	5	LMAT1101 AND LMAT1102	
Master [120] in Environmental Science and Management	ENVI2M	5		
Bachelor in Bioengineering	BIR1BA	5	LBIR1110 AND LBIR1111	