

## Faculty of Biological, Agronomic and Environmental Engineering

### BIR1202 Applied computer science

[22.5h+7.5h exercises] 3 credits

This course is taught in the 1st semester

**Teacher(s):** Philippe Sonnet  
**Language:** French  
**Level:** First cycle

#### Aims

To develop for the student an operational knowledge of computer science in order to use this skill in the field of biological, agronomical and environmental engineering.

#### Main themes

1. General notions concerning the computer, the information handling and storing.
2. Initiation to programming principles and algorithms.
3. Introduction to an existing scientific programming language.
4. Introduction to data base design and management.

#### Content and teaching methods

The course develops basic notions in the following fields:

1. Logical processes, ports, flip-flop, central memory, mass storage
2. ASCII code and UNICODE; representation of numbers in binary notation, hexadecimal, two-complement, biased and floating points; arithmetic IEEE, truncate and overflow errors; representation of bitmap and vector images; color coding; file compressing; image formation
3. Computer hardware architecture, description and functioning of micro-processors, arithmetical logical unit, control unit, machine instructions, machine cycle, controllers, bus, parallel and in series communications, computer performance
4. Algorithmic, pseudocode, methods for analysing problems and designing algorithms, programming language, historical evolution, declaration of variables, typical and object oriented languages, homogeneous and heterogeneous tables, primitives, iterative structures, recursion
5. Structure and functioning of an operating system
6. Networks, IP adress, routers, domains, World Wide Web, network security
7. Structure of data and data files
8. Practicing the MATLAB language, initiation to HTML language as well as to TelNet and to FTP protocols.

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

Supplemental courses : BIR 1201 'Exercices intégrés en mathématiques et informatique'

Support : Distributed notes, reference book

Framing : teacher and assistants

#### Other credits in programs

|                |  |             |           |
|----------------|--|-------------|-----------|
| <b>BIR12BA</b> | Deuxième année de bachelier en sciences de l'ingénieur, orientation bioingénieur | (3 credits) | Mandatory |
|----------------|--|-------------|-----------|