TCSS6AC COMPUTER SCIENCE 2

TCSS6AC **Computer Science 2**	**Duration :** 30 hours	**ECTS Credits :** 3.5	**Semester :** S6

Person(s) in charge:

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Keywords : Computer Science, programming, data structures, scientific questions

Prerequisites : Programing notions in Python

Objective : Global computer science course through the example of a programing language

Program and Content :

Data oriented conception : abstract model of the world, precision and coverage of the representation.
Example of a tutorial : animal population model, dynamic of population.

Computational recursion, conceptual strength, self referencing problems, link with maths and logic. Recursive structure, trees, graphs, inductive reasoning, choice of display.
Example of a tutorial : L-systems, living creatures modelisation by rewriting rules

Computational networks, OSI models, notions of adress, communication protocol, port.
Example of a tutorial: Communication between programs through sockets, internet access.

Bio-inspired algorithms, binary cellular automaton, neuronal networks and genetical algorithms.
Example of a tutorial: placement of nodes in a graph.

Robotics, reactive programming, call-back.
Example of a tutorial: movement of a robot, trajectory conception, A* algorithms.

Abilities :

Levels	Description and operational verbs
Know	Fundamental aspects of computer science: programming notions, calculus notions, links between math and computer science. Current scientific questions like complexity, bio-inspired algorithms, language processing.
Understand	Computational networks, layered model Interactions between the real world and the computational world.
Apply	Programming with Python. Mastery of a programming environment: edition, execution, debug, project organization, executables synthesis.
Analyze	Definition of data structures, display choices. Specifications of an issue, abstract models conception. Functional analysis of problems.
Summarise	A computational solution for elementary problems. Nested looped algorithms. Network protocol.
Assess	The complexity of a computational problem, the quality of an algorithm, network protocol.

Evaluations :

☐ Written test	☑ Continuous Control	☑ Oral report	☐ Project	☐ Written report