

Programming 1

1. **Course number and name:** 020IF1NI2 Programming 1
2. **Credits and contact hours:** 4 ECTS credits, 2x1:15 contact hours
3. **Name(s) of instructor(s) or course coordinator(s):** Tony Nicolas
4. **Instructional materials:** Course handouts, PowerPoint slides

5. Specific course information

a. Catalog description:

This course introduces the universal computer and the basic concepts of high-level programming using Python. Topics include: computer hardware components, algorithms, programming languages, Python and the IDLE environment, variables, arithmetic expressions and operators, primitive data types, data input and output, built-in composite data types, simple statements, control statements, logical expressions, relational and logical operators, function definition and call, functions from external modules, and a brief overview on recursive structures.

b. Prerequisites: None

c. Required/Selected Elective/Open Elective: Required

6. Educational objectives for the course

a. Specific outcomes of instruction:

- Recognize the role of the main computer components.
- Design algorithms to solve scientific problems.
- Translate algorithms to computer programs.
- Define and use variables of different data types.
- Identify and use the suitable control structure for a particular case.
- Identify the code to be modularized as functions.
- Write the definition of a simple function.
- Identify and analyze a recursive structure.
- Use a function defined in an external module.
- Develop a computer program using Python.

b. PI addressed by the course:

PI	1.2	1.3
Covered	x	x
Assessed	x	x

7. Brief list of topics to be covered

- Introduction to computer programming, the elements of the universal computer, binary-decimal conversion (2 lectures)
- Introduction to Python, IDLE, and simple statements using print function and arithmetic operators (1 lecture)
- Variables, expressions, data types, conversion between data types, input function (2 lectures)
- Logical tests and conditional control structures (2 lectures)
- Functions from external modules (1 lecture)
- Iterative control structures (while and for loops) (5 lectures)
- Function definition and call (2 lectures)
- String object and its methods, their traversal, searching through them, selecting elements (3 lectures)
- Lists and tuples and their methods, their traversal, searching through them, selecting elements (4 lectures)
- Dictionaries and their methods, their traversal, searching through them, selecting elements (1 lecture)
- Recursion (1 lecture)