Programming 1

1. **Course number and name:** 020IF1CI2 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 covers the hardware components of a computer and the basic concepts of high-level programming using Python. The topics addressed include the computer's hardware components, algorithms, programming languages, Python and the IDLE environment, variables, arithmetic expressions and operators, primitive data types, input and output of data, built-in composite data types, simple statements, control statements, logical expressions, relational and logical operators, function definition and call, functions from external modules.

   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.
   - Resolve problem with recursive function.
   - 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, Pyzo, and simple statements using print function and arithmetic operators (1 lecture)
   - Variables, expressions, data types, conversion between data types, input function (4 lectures)
   - Logical tests and conditional control structures (3 lectures)
   - Functions from external modules (1 lecture)
   - Iterative control structures (while and for loops) (10 lectures)
   - Function definition and call (1 lecture)
   - Recursive functions (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 (2 lectures)
   - Numerical method (3 lectures)