Programming 1

1. **Course number and name:** 020IF1NI2 Programming 1

2. **Credits and contact hours:** 4 ECTS credits, 2 x 1:15 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	1.1	7.1
Covered	x	x
Assessed		

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)