Course Unit Descriptor

Study Programme: Biomedical engineering

Course Unit Title: Introduction to Computer Science

Course Unit Code: BMI95

Name of Lecturer(s): Segedinac Milan

Type and Level of Studies: Bachelor

Course Status (compulsory/elective): compulsory

Semester (winter/ summer): winter

Language of instruction: english

Mode of course unit delivery (face-to-face/distance learning): face-to-face

Number of ECTS Allocated: 5

Prerequisites: none

Course Aims:.

Understanding the concepts, elements, and structure of computer programs, and basic algorithms for data processing.

Learning Outcomes:
Upon successful completion of this course students gain understanding of main computer program concepts and are able to write programs that interact with users; handle different types of data; use basic structural concepts in programming - sequences, selections, and iterations; use subprograms and decompose complex programs; understand elements of software development process; understand elements of algorithm analysis.

Syllabus.
The notion of a computer program: the role of hardware and software in a computer system; basics of modern computer operation; the form and function of programming languages; features of the Python programming language; elements of a Python program. Handling numbers: the notion of a data type; numerical data types; representing numbers in a computer; accumulator variables; using mathematical functions. Handling strings: the notion of string and its computer representation; operations on strings; string formatting. Decision structures: the notion of decision; single, double, and n-ary decisions; handling exceptions. Loops and logical expressions: the notion of a loop; finite and infinite loops; interactive and sentinel loops; nested loops; Boolean algebra and Boolean expressions. Subprograms: program decomposition; invoking subprograms; transfering parameters and results; subprogram collections; recursion. Data collections: arrays, operations on arrays, multidimensional arrays; dictionaries. Software development process: representing a real system in a computer program; top-down and spiral development, program testing. Algorithm analysis: concepts, the notion of search, linear and binary search, sorting algorithms.

Required Reading:

Weekly Contact Hours: 2	**Lectures: 3**	**Practical work: 0**

Teaching Methods:
Lectures; Computer practice. Consultations. The examination is oral. The final grade is formed on the bases of success at laboratory practice and oral examination.

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	**Final exam**	points
Attendance			
Computer exercises			
Tests (4x)			