

## Programming in Python (for beginners)

| Course Workload |       | Assessment form<br>(examination/ graded<br>test/ ungraded test) |
|-----------------|-------|-----------------------------------------------------------------|
| ECTS            | Hours |                                                                 |
| 3               | 108   | Exam                                                            |

The course is aimed at learning basics of programming in Python language. At the same time, during the course students apply gained knowledge to solve simple bioinformatics problems.

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### **Course structure:**

#### 1. Python Basics. Control Flow.

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- 1.1. Numbers (int, float)
  - 1.2. Strings
  - 1.3. Boolean Type
  - 1.4. Variables and rules for naming variables
  - 1.5. Arithmetic Operators
  - 1.6. Comparison Operators
  - 1.7. Logical Operators
  - 1.8. input(), print()
  - 1.9. Indentation
  - 1.10. if statement
  - 1.11. break, continue statements
  - 1.12. while and for loops

#### 2. Data Structures. Functions. Functional Programming

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- 2.1. List (list methods, list comprehension)
  - 2.2. Set (set methods, operations with elements)
  - 2.3. Dictionary (dictionary methods, dictionary vs list)
  - 2.4. Tuple
  - 2.5. Function name, return statement
  - 2.6. None type, is operator
  - 2.7. Function arguments, Recursion
  - 2.8. lambda functions
  - 2.9. Briefly about iterators
  - 2.10. map(), filter(), reduce(), zip() functions

#### 3. Call stack. Namespace. Modules. Files. Python Classes.

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- 3.1. Stack Data Structure

- 3.2. Stack example by using list in Python
  - 3.3. Call stack
  - 3.4. Namespace, scope
  - 3.5. LEGB rule
  - 3.6. Modules
  - 3.7. Files in Python. Reading files. Write to files
  - 3.8. Attributes, methods
  - 3.9. Instantiation
  - 3.10. self parameter
  - 3.11. Underscores
  - 4. Inheritance. Iterators. Generators. Errors. Exceptions
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- 4.1. Parent class and Child class
  - 4.2. type(), isinstance()
  - 4.3. Subclass attributes
  - 4.4. Multiple inheritance
  - 4.5. Method Resolution Order (MRO)
  - 4.6. Creating iterable data types
  - 4.7. Generators
  - 4.8. Syntax Errors
  - 4.9. Exceptions, Handling Exceptions
  - 4.10. User-defined exceptions
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