Tárgytematika / Course Description
Python programming

GKNM_MSTA038

Tárgyfelelős neve /
Teacher's name: dr. Környei László

Félév / Semester: 2024/25/2

Beszámolási forma /
Assesment: Vizsga

Tárgy heti óraszáma /
Teaching hours(week): 2/4/0

Tárgy féléves óraszáma /
Teaching hours(sem.):   0/0/0

OKTATÁS CÉLJA / AIM OF THE COURSE

The goal of the course is to introduce a modern, dynamically typed programming language (Python), and to teach the programming approach and techniques needed to use the language efficiently.

TANTÁRGY TARTALMA / DESCRIPTION

- Programming concepts: algorithm, data structure programming language. Characteristics of Python. History. Simple data types: int, float, complex, str, bool. Operations and expressions.
- Collections: tuple, list, set, dict. Standard streams. Output formatting.
- Control structures: if, while, for. Exercise: Simple number guessing game.
- Comprehensions. Sorting. File handling. Exercise: Word statistics in Hamlet.
- Functions. Lambda expressions. Exercise: Premier League standings.
- Modules and packages. NumPy: creating arrays, slicing, operations, broadcasting. Basics of matplotlib.
- Advanced language constructs: unpacking, enumerate, zip, generators, decorators.
- Elements from the standard library, part I.: datetime, time, math, random, copy. Exception handling. Debugging.
- Object oriented programming. Special ("dunder") attributes and methods. Exercises: Simple vector class, Conway's game of life.
- Elements from the standard library, part II.: collections, glob, gzip, os, pickle, subprocess, urllib.
- Python Data Analysis Library (pandas), part I.: DataFrame and Series, simple queries.
- Python Data Analysis Library (pandas), part II.: more complex queries, visualization. Exercises: Air pollution in London, FIFA players.

SZÁMONKÉRÉSI ÉS ÉRTÉKELÉSI RENDSZERE / ASSESMENT'S METHOD

The course ends with an exam, where the students solve simple programming problems in Python. The available time is 90 minutes. Following the computer-based part of the exam, students must validate the originality of their work through an oral exam. Scoring: 21-24: 5 (excellent), 18-20: 4 (good), 15-17: 3 (satisfactory), 12-14: 2 (pass).

KÖTELEZŐ IRODALOM / OBLIGATORY MATERIAL

- Mark Pilgrim: Dive into Python 3 (http://www.diveintopython3.net/).
- Zed A .Shaw: Learn Python 3 the Hard Way, Addison-Wesley, ISBN: 9780321884916.

AJÁNLOTT IRODALOM / RECOMMENDED MATERIAL

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