



1. Tárgy neve	Python from the basics to artificial intelligence				
2. Tárgy angol neve	Python from the basics to artificial intelligence		3. Szerep	szv	
4. Tárgykód	BMEKOGG8511	5. Követelmény	f	6. Kredit	2
7. Óraszám (levelező)	0 előadás	0 gyakorlat	2 labor	8. Tanterv	

9. A tantárgy elvégzéséhez szükséges tanulmányi munkaóra összesen					60 óra
Kontakt óra	28 óra	Órára készülés	6 óra	Házi feladat	20 óra
Írásos tananyag	6 óra	Zárthelyire készülés	0 óra	Vizsgafelkészülés	0 óra

10. Felelős tanszék	Gépjárműtechnológia Tanszék
11. Felelős oktató	Dr. Tihanyi Viktor
12. Oktatók	Remeli Viktor, Vincze Zsolt, Csonthó Mihály

13. Előtanulmány	-
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14. Előadás tematikája	-
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15. Gyakorlat tematikája	-
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16. Labor tematikája	Imperative, procedural and object-oriented programming in Python. Using the Python interpreter and the google colab environment. Variables, types, assignment, expressions, control flow. Branching and loops. Simple algorithms. Function design, stack, visibility, pass by reference vs. pass by value. Character strings, formatting, regular expressions. Useful data structures: sets, lists, tuples, dictionaries (maps). Data structure implementations: arrays, linked lists, trees, hashing. Interfaces, classes and objects. Object-oriented programming and its advantages. Object-oriented design patterns. Multithreading and functional programming. Using external libraries (numpy, pandas). Data science and artificial intelligence applications (sklearn, scipy, tensorflow, keras). Visualization (plotly, matplotlib).
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17. Tanulási eredmények	<p>a) Knowledge:</p> <ul style="list-style-type: none"> - familiarity with basic programming concepts, - familiarity with basic elements of the Python programming language, - familiarity with object oriented and functional programming paradigms, - familiarity with data science and machine learning libraries <p>b) Capability:</p> <ul style="list-style-type: none"> - can take part in software development projects in their engineering field, combining and applying the attained knowledge in their professional domain <p>c) Attitude:</p> <ul style="list-style-type: none"> - strive to perform at their best capability, work precisely and without error - strive to keep all software security, data protection, safety and pandemic regulations - strive to cooperate with their colleagues (unless prohibited) <p>d) Autonomy and responsibility:</p> <ul style="list-style-type: none"> - sets example by keeping high quality and ethic standards in their work, using the attained knowledge with responsibility
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18. Követelmények, az osztályzat (alíírás) kialakításának módja	At the end of the semester the student will present a homework related to a given data analysis or AI modeling task. During homework presentation, their identity must be proven with an official document with a photograph (national ID, student ID, driving license, passport, etc.).
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19. Pótlási lehetőségek	On the retake week at the end of semester the student may resubmit their homework once without incurring any fee, and if necessary once more but then an administrative fine is also due. The requirements for resubmission are the same as for regular submission.
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20. Jegyzet, tankönyv, felhasználható irodalom	[01] Dr. Charles R. Severance: Python for Everybody. https://www.py4e.com/book.php
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