**Table 5.2.** Specification of subjects

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| **Study program:** Advanced Data Analytics in Business | | | | |
| **Name of the subject: Programming for business applications 1** | | | | |
| **Teacher(s):** Marko D. Petković, Ronald Hochreiter | | | | |
| **Status of the subject:** Core subject | | | | |
| **Numebrs of ECTS credits: 8** | | | | |
| **Conditions:** none | | | | |
| **Subject goal**  Acquiring knowledge about basic and advanced elements of programming algorithmic approach to problem solving in the Python programming language. Enabling students to successfully follow other courses in which contet there is elements of programming in Python. | | | | |
| **Outcome of the subject**  Students will be able to:   * apply object-oriented programming to optimization problems and decision theory; * perform basic and intelligent data processing; * independently solve programming problems using the syntax and semantics of the Python. | | | | |
| **Subject content**  *Theory*  **Introduction:** Basics of programming, precise formulation of the problem and methods for its solving, splitting the complex problem to easier subproblems, notion of algorithms and basic characteristics.  **Introduction to programming in****Python**: installation of Python and additional packages (pip), python IDEs (PyCharm, Spyder, Jupyter), variables and data types, assignment statement, parsing variables from input, output formats for different data types, If statement, loops, tuples and lists, basic operations with tuples and lists, functions, function parameters, recursion, global variables, lambda expressions, sets and dictionaries with basic operations, file management.  **Applications of Python in business analytics**: Numerical computations (numpy andscipy), optimization problems (scipy.optimize, mip), decision theory, statistics and elementary data processing (pandas), advanced and intelligent data processing (skilearn), documents manipulation (Word, Excel, PDF).  *Practical learning*  Practical work in computer classroom. Practical exercises on the topics covered by lectures. | | | | |
| **Literature**   1. Al Sweigart, Automate the Boring Stuffwith Python, No Starch Press, San Francisco, 2015. 2. Jaan Kiusalaas, Numerical methods in engineering with Python 3, Cambridge University Press, 2013. 3. John Hunt, Advanced guide to Python 3 programming, Springer, 2019. | | | | |
| **Number of active teaching classes** | **Theorethical teching:** 45 | | **Practical teaching:** 30 | |
| **Method of carrying out the teaching**  Interactive lectures using screen sharing in the computer classroom.  In order to fulfill pre-examination obligations and the final exam, students need about 60 hours of independent study and practice, of which 2 hours a week during the semester and about 30 hours of preparation during the exam period. | | | | |
| **Evaluation of knowledge (maximum number of points 100)** | | | | |
| **Pre-exam obligations** | points | **Final exam** | | points |
| Activity during lectures | 10 | Written exam | | 0 |
| Practical teaching | 10 | Oral exam | | 50 |
| Colloquium | 20 | Project presentation | | 0 |
| Seminar(s) | 10 | **Total** | | **100** |