**Table 5.2** Specification of subjects

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| **Study program:** Advanced Data Analytics in Business | | | | |
| **Name of the subject: Time Series Forecasting** | | | | |
| **Teacher(s):** Vinko Lepojević, Vesna Janković-Milić | | | | |
| **Status of the subject:** Core subject | | | | |
| **Number of ECTS credits: 8** | | | | |
| **Conditions:** completed course Programming for business applications 1 | | | | |
| **Subject goal**  Mastering models and methods in the analysis and forecasting of time series and preparing students for the application of acquired knowledge to data from various fields of economics. This course offers a comprehensive approach to advanced modelling of time series. Students can master various analytical tools that will enable them to understand time series. | | | | |
| **Outcome of the subject**  After this course students will be able to:   * Use Python to perform calculations with time and date based data; * Create models for time series data; * Use models for forecasting; * Identify which models are suitable for a given dataset; * Visualize time series data; * Transform standard data into time series format; * Clean and pre-process time series; * Create ARIMA and exponential smoothing models, * Identify the best time series libraries for a given problem; * Compare the accuracy of different models. | | | | |
| **Subject content**  *Theory*  Working with data sets and time in Python, Time Series Data Pre-Processing and Vizualization, Statistical Background for Time Series Analysis and Forecating, ARIMA models, Multivariate Time Series Analysis, Neural Networks in Time Series Analysis.  *Practical learning*  Application of time series analysis and forecasting methods on concrete data using programming language Python. | | | | |
| **Literature**   1. Brooks, C. М. (2014). *Introductory Econometrics for Finance* [3rd Edition],Cambridge University Press. 2. Montgomery, D., Jennings, C., Kulachi, M.(2015). *Introduction to Time Series Analysis and Forecasting*, Wiley 3. Mather, B. (2019). *Time Series with Python: How to Implement Time Series Analysis and Forecasting Using Python.* Kindle Edition. | | | | |
| **Number of active teaching classes** | **Theoretical teaching:** 45 | | **Practical teaching:** 30 | |
| **Method of carrying out the teaching**  Presentation, dialogue, graphics, programming language demonstration, indvidual work. | | | | |
| **Evaluation of knowledge (maximum number of points 100)** | | | | |
| **Pre-exam obligations** | points | **Final exam** | | points |
| Activity during lectures | 10 | Written exam | |  |
| Practical teaching | 10 | Oral exam | |  |
| colloquium | 20 | Project presentation | | 50 |
| Seminar(s) | 10 | **Total** | | **100** |