**Table 5.2.** Specification of subject

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| **Study programme:** Advanced Data Analytics in Business | | | | |
| **Name of the subject: Quantitative Finance** | | | | |
| **Teacher(s):** Srđan Marinković, Mirjana Jemović, Jelena Radojičić, Jelena Z. Stanković | | | | |
| **Status of the subject:** Obligatory | | | | |
| **Numbers of ECTS credits: 8** | | | | |
| **Conditions:** basic or intermediate knowledge in the theory of financial markets, mathematical and computation literacy (linear algebra), ability to use Excel and Python. | | | | |
| **Subject goal**  The aim of the course is to extend undergraduate students’ knowledge about financial market analytics as well as practitioners’ understanding of various segments of financial markets: bond, stock and derivative assets market. | | | | |
| **Outcome of the subject**  Capability to do analysis and based investment and financial decision making on quantitative data. Ability to extract information about transaction prices, yields and turnover data from relevant markets and data vendors, as well as to process information for making decisions related to securities investments (time series models, linear models, numerical procedures). | | | | |
| **Subject content**  *Theoretical lectures:The role of finance and financial instruments (direct and intermediary finance, exchange and OTC markets); Types of financial instruments, securities and contracts (short-term securities, bonds, stocks and derivatives); Financial market data (closing prices, volume and return data, data sources and vendors); Basic concept in financial assets valuation (PV, IRR); Interest rates and bond valuation (yield curve, bond price, bond duration and convexity); Portfolio management (security market line, portfolio optimization); Introduction to option theory (European call and put options, American options, option pricing).*  *Practical learning: Data visualisation (plotting price and volume charts, daily percentage returns and cumulative returns,histograms and volatility charts); Time series analysis (Q-Q plots, correlation matrix, moving averages); Basic concept in valuation (calculation of NPV, IRR); Fixed-coupon mathematics (valuing zero-coupon and coupon bond using Excel and Python, bootstrapping yield curves, calculating forward rates from the yield curve, calculating the yield to maturity, proce of a bond and duration). Portfolio optimization (solving for the security market line using regression, multivariate linear regression, and linear optimization in portfolio allocation); Pricing european options.*  (While the lectures are devoted to discussing mainstream theory, the assignments serve to solve specific computational problems. It is advisable to work in groups closely monitored by course instructors). | | | | |
| **Literature**   1. James Ma Weiming (2019) *Mastering Python for Finance*, Packt Publishing, 2nd edition. 2. Yan Yuxing (2014) *Python for Finance: Build real-life Python applications for quantitative finance and financial engineering*. Packt Publishing. 3. David Blake (2002) *Financial market analysis*, John Willey and Sons, Chichester; 4. John Hull (2017) *Option, futures and other derivatives*, Pearson, 10th edition. | | | | |
| **Number of active teaching classes** | **Theoretical teaching: 30** | | **Practical teaching: 45** | |
| **Method of carrying out the teaching:** Presentations, Program language demonstrations, individual work | | | | |
| **Evaluation of knowledge (maximum100 points)** | | | | |
| **Pre-exam obligations** | points | **Exam results** | | Points |
| Activity during lectures | 10 | Written exam | | 50 |
| Practical teaching | 10 | Oral exam | | *-* |
| Colloquium | 30 | Project presentation | | - |
| Seminar(s) | - | **Total** | | **100** |